

NATURE STUDY AND HEALTH EDUCATION

FOR THE
FOURTH YEAR



BY
ALICE JEAN PATTERSON

PUBLISHED BY
McKNIGHT & McKNIGHT
NORMAL, ILLINOIS

letter



Digitized by the Internet Archive
in 2024

NATURE STUDY
AND HEALTH EDUCATION
FOR THE
FOURTH YEAR

Nature Study and Health Education

FOR THE
FOURTH YEAR

BY
ALICE JEAN PATTERSON



PUBLISHED BY
McKNIGHT & McKNIGHT
NORMAL, ILLINOIS

COPYRIGHT, 1927, BY
McKNIGHT & McKNIGHT
NORMAL, ILL.

PREFACE

THE PLAN OF THE BOOK. This book covers work for a year in nature study and health education for fourth grade children. The purpose of the book is to help bring children into first hand contact with nature objects, and to aid them in forming permanent health habits. An effort has been made to arrange workable lessons for the busy teacher and at the same time to make them simple enough to place in the hands of children.

The nature study lessons are arranged with reference to a seasonal sequence. The material suggested will always be available at the time of year for which the lessons are planned.

It is probable that every school may not have sufficient time for a thorough study of all the topics suggested. In that case the superintendent and teachers may choose the units that seem best adapted to their school conditions. In some schools it may be best to study garden plants and do little with trees. In others it may be wiser to emphasize trees and do little with some of the other units suggested. The nature objects that are readily found in the vicinity of the school will help to determine what topics to choose.

A WORD TO THE TEACHER. Teachers will find that there are four distinct types of lessons suggested; discussion, observation, the story, and methods of expression. A few projects are suggested which include all four types.

In most of the lessons the book should be open in the hands of the pupils during the recitation whatever type of lesson may be under consideration.

The discussions comprise conversational lessons in which the children express in oral language facts drawn from experience or from observation. These are usually introductory to the observation lessons and may include outdoor assignments.

The observation lessons always mean a study of real objects either out of doors or in the school room. Often the children may bring in the objects for study. Occasionally pictures may take the place of real objects. For example, in the study of wild mammals it will probably be impossible to find for observation, living specimens of all the wild animals suggested. Pictures may be substituted for some of them. (See pictures in Bibliography, page 130.) Where a museum is accessible a trip may be planned to observe the mounted specimens.

The stories found in connection with most of the topics are designed to give additional information that can not easily be gained by observation.

They are written in a vocabulary suited to fourth grade children. They may be read in class or they may be assigned for outside reading and then reported and discussed during the recitation period.

The most important method of expression used is language. Every good nature study lesson is at the same time a lesson in oral language. The children are seeing things as they are and are telling the truth about what they see. Expression in written language is arranged in the accompanying notebook. This includes filling in blanks, choosing the correct word to express a truth, and writing short paragraphs, or sentences.

A variety of handwork is suggested as a method of expression. This includes drawing, coloring, paper cutting, and mounting pictures or pressed specimens. This work may be done in the class period or during study hours.

It is a wise plan at the beginning for the teacher to look carefully through the work of an entire term, in order to plan her lessons to the best advantage. She must realize that all the lessons of one unit can not be consecutive. Frequently after the first observation she must wait for growth and development of the object before she can have the next lesson. To illustrate, the first study of the elm is made early in the spring when the flower buds are opening. This is followed a number of days later by the study of the opening leaf buds and still later by a study of the fruit. In the meantime lessons on birds, wild flowers and trees are taught. Thus the nature study teacher soon learns to carry along two or three lines of work at the same time.

In some cases an outdoor study and collecting trip may precede the main lessons of a unit by a number of weeks. The study of pods and seeds of pod trees need not be taught until late in the fall. But the study of the leaves and the collecting of the fruit should be done before the leaves drop from the trees. Some of the leaves may be pressed and kept for review when the later lessons are taken up.

All the health lessons suggested should be taught. Weighing and measuring the children should begin about the third week of the fall term. If possible the weight and height should be taken once each month.

The health habits should be discussed at the time of the first weighing and certain ones chosen to stress for the month. Every effort should be made to arouse and keep the interest of the children in practicing their health rules. The playlets, stories and the notebook work suggested in connection with the health lessons are all incentives toward keeping up the interest.

ACKNOWLEDGMENT. The author wishes to express her gratitude to Prof. E. A. Turner and to the teachers and the pupils of the Training School of the Illinois State Normal University for the opportunity to

work out the lessons found in this book. She also acknowledges her indebtedness to Miss Jessie Dillon for her critical reading of the manuscript, and to Miss Lora M. Dexheimer for her reading of the proof. For the non-original illustrations she is indebted to *The Nature Magazine*, to the Public School Publishing Company, and to the Illinois *Arbor and Bird Day Bulletin*.

Alice Jean Patterson.

Normal, Ill.
July 15, 1927

TABLE OF CONTENTS

FALL STUDIES

CHAPTER	PAGE
I. GARDEN PLANTS	1
II. CLIMBING PLANTS.	5
III. VEGETABLE STUDIES	10
IV. HEALTH.	14
V. HOMEMAKING INSECTS—BEES	17
VI. BUMBLE BEES	24
VII. MUD WASPS	26
VIII. PAPER WASPS	29
IX. TREES	34
X. OTHER POD TREES.	38
XI. SEED STICKERS.	41
XII. EXERCISE AND HEALTH	46
XIII. BARNYARD FOWLS	51

WINTER STUDIES

XIV. EVERGREEN TREES.	54
XV. HEALTH DRINKS	60
XVI. BIRDS IN WINTER	63
XVII. HEALTH—FIRES AND LEISURE TIME.	71
XVIII. WILD MAMMALS—RABBITS	73
XIX. SQUIRRELS	77
XX. SMALL MAMMALS.	79
XXI. FUR BEARING ANIMALS	85
XXII. MICE AND RATS	89
XXIII. TEETH	91

SPRING STUDIES

XXIV. PLANTS	94
XXV. GROWING PLANTS FROM UNDERGROUND PARTS.	98
XXVI. BIRDS IN SPRING	102

CHAPTER		PAGE
XXVII.	TREES	106
XXVIII.	WILD FLOWERS.	111
XXIX.	CLEANLINESS—HEALTH	123
XXX.	RECALLING THE YEAR'S WORK—VACATION	125

LIST OF ILLUSTRATIONS

	PAGE
A Fourth Grade Child in Her Flower Garden.	1
California Poppies.	2
A Cluster of Four-o'Clock Flowers	3
Twining Stems of a Wild Morning Glory	5
Spray of Sweet Pea. Notice the Tendrils by Which It Climbs	6
Leaves of Woodbine Showing the Five Leaflets.	7
A Porch Covered With White Clematis.	8
A Spray of Poison Ivy Showing the Three Leaflets.	9
A Bean Leaf Showing the Three Leaflets.	10
Open Pod of String Beans. Hand Work Done by a Pupil.	11
A Pod of Lima Beans. Notice How the Beans Are Joined to the Pod.	12
Beans Grown in a Child's Own Garden	12
Eat Some Vegetables Every Day.	16
Capturing a Bee in a Jelly Glass.	17
The Head of a Honey Bee	18
The Hind Leg of a Bee.	18
The Different Forms of Bees Found in One Family	20
Two Common Bee Hives	22
The Home of a Mud Dauber.	26
A Mud Dauber Wasp.	27
Homes of a Mud Wasp Made in the Form of Water Bottles	28
The Paper Nest of a Polistes Wasp	29
Nest of a Hornet	30
A Hornet's Nest With Part of the Paper Case Removed to Show the Cells on the Inside	31
A Hornet as It Looks When Flying	32
Some Common Tree Leaves	34
Compound Leaves of Locust Trees	35
Flowers and Leaves of the Common or Yellow Locust.	36
Pod of the Honey Locust.	37
Pod of the Red Bud.	38
Leaf of a Red Bud.	38
Pod of a Kentucky Coffee Tree	39
Pod of a Catalpa Tree.	39
The Large Leafed Burdock Plant	41
Two Burdock Burs.	42
A Branch From a Cocklebur Plant	43
A Cluster of Spanish Needles.	44
A Spray of Sand Burs With Their Sharp Spines	44
Play Out of Doors Every Day	46

	PAGE
Children Enjoying Swings on School Grounds	47
The Teeter Board Provides Gentle Outdoor Exercise	48
Fourth Grade Children Having a Good Time on a Slide	49
A Flock of Turkeys	51
Spray of a White Pine.	54
Spray of a Red Pine	55
A Chart Showing Cones of Different Kinds of Evergreen Trees	55
A Small Branch From a Spruce Tree	56
A Small Branch From a Hemlock Tree	57
Arbor Vitae.	58
A Red Cedar	58
A Pretty Grove of Evergreen Trees.	58
A Pretty Winter Bouquet Made of Pine Cones and Leaves	59
A Bluejay Ready to Help Himself From a Feeding Shelf.	65
A Pair of Cardinals.	67
Bob White	68
A Pet Rabbit. This is a Young Belgian Hare	74
Rabbits Cut Out of Paper for the Notebook	75
A Gray Squirrel Feeding Upon a Nut	78
Jim, the Pet Gopher in His Cage.	79
A Saucy Little Chipmunk.	83
A Skunk Eating His Dinner	86
Good Teeth Mean Good Health	92
Cotton Bolls.	95
A Cotton Seed Covered With Fibers.	96
Two Cotton Plants With the First Pair of Leaves	96
A Cotton Plant Ready to Transplant to the Garden	97
Potato Tuber Showing the Growing Buds	98
A Potato Tuber Showing the Stem End.	99
A Potato Plant Grown in the Schoolroom	100
A Pair of Rosebreasted Grosbeaks and Their Nest.	103
The Nest of a Baltimore Oriole	104
Flowers of the White Elm	106
Elm Leaves.	107
Winged Seeds of the American Elm.	107
A Beautiful Old Elm	108
Leaf of a Hackberry Tree.	109
Dog Tooth Violets.	111
A Violet Showing the Rootstock Which Spreads Underground and Sends Up New Plants	112
Wild Columbine	113
A Delightful Spot in the Woods	116
Fourth-Grade Children Playing a Ball Game	125
A Young Gardener Having a Good Time With His Plants	126

FOURTH YEAR

FALL STUDIES

CHAPTER I GARDEN PLANTS

VACATION REPORTS. Vacation is over and while you may have had a very pleasant one I am sure you are all glad to be back in school again.

How did you spend your vacation? Who took a trip? How did you travel? Who stayed at home? Tell some of the interesting things that you did there. Who worked in your garden?



A FOURTH GRADE CHILD IN HER FLOWER GARDEN.

Who helped in the family garden? If you have a garden of your own, tell what you raised. What did you do with your vegetables? What did you do with your flowers? Who has some flowers in blossom now? Who can bring some flowers to school for study? If you do not have a garden of your own, perhaps you can bring some from the family flower garden. Bring some of the leaves with each kind of flower. Put them all in water so they will not wilt. When class time comes, sort the flowers, placing all of the same kind together in a vase or glass.

CALIFORNIA POPPY. If California poppies have been brought in, begin your study with one of these. As you may expect from its name, this flower is a native of California. Years ago people from Spain away across the Atlantic Ocean came to California to make their homes. These settlers found great tracts of land covered with beautiful golden yellow flowers. They gave them a name that means "cups of gold." Later when people from eastern United States moved into California and found these flowers, they called them California poppies. If you do not have any of these in your garden, plan to raise some of them next year.

OUTDOOR OBSERVATION. Observe the California poppies as they are growing in the yard. Notice that each plant forms a pretty little bush with stems growing close together. How high is the plant? Which is taller, the leaves or the flowers?



CALIFORNIA POPPIES.

INDOOR OBSERVATION. Each child should have a leaf and a flower to examine. Notice that each leaf is divided into many small parts which look like fringe.

THE FLOWER. What color is the main part of the flower? This part is made up of petals. How many petals are there? Look closely at one to see whether it has more than one shade of yellow. What is the color of the flower stem? (Notebook, page 3.)

HANDWORK. Cut a flower stem out of the right shade of green paper. Paste this in your notebook. Cut the petals out of yellow paper and arrange them at the top of the stem, making

the form of the flower. Cut a leaf and paste it farther down on the page. You may draw the flower and leaves and color them with crayola. (Notebook, page 3.)

SEED PODS. Find a seed pod on the California poppy. How long is it? Open it and find the seeds. How many in one pod? Describe their size and color. Cut the form of the seed pod out of paper and paste it in your note book. Place two or three of the seeds beside it. Stick them on with glue and put tissue paper over them to keep them in place. (Notebook, page 3.)

THINGS TO LOOK FOR. Look at a flower that is not yet open. This is a flower bud. What color is it? See if you can find out what happens to this green part when the flower opens. This green pointed cap which encloses the yellow flower, drops off when the bud opens. Watch the flowers towards evening to see whether they close up at night. Can you name some other flowers that close at night? Watch the dandelion.

FOUR-O'CLOCK —
OUTDOOR OBSERVATION.
The four-o'clock is another interesting flowering plant to observe. How tall does it grow?

Notice that it grows like a little tree with stem and branches instead of growing in the form of a bush, like the California poppy. Compare the leaves with those of a California poppy. Which is the brighter green? How do they differ in shape?

FLOWERS. Where on the stems are the flowers? What different colors do you find? Which do you like best? About what time each day do the flowers open? Look at the flowers



A CLUSTER OF FOUR-O'CLOCK FLOWERS.

early in the morning to see whether they have remained open all night. What do they do later in the day?

SEEDS. Where are the seeds of the four-o'clock? How many are in one place? What color are they? Collect a number of seeds to plant next spring. (Notebook, page 3.)

HANDWORK. Cut the form of a flower out of paper. Cut a leaf and a stem. Paste them in your notebook. (Notebook, page 4.)

STORY. If you were to go far south until you came to a country called Peru in South America, you will find four-o'clocks growing wild in the fields and meadows. They are very beautiful in the evening when they all open up their flowers at about the same time. Travelers who found them there years ago called them "The Marvel of Peru." Marvel means wonder. If you look in a seed catalogue, you will find that they are still called by this old name. Some of the seeds were taken into Europe and people there began to grow them. Some were brought into the United States and now they are grown all over our country. Children are especially fond of four-o'clocks.

OTHER FLOWERS. If you have brought in other flowers, study them as you did the California poppy and the four-o'clock. Cut out and mount the flowers and leaves of each kind. (Notebook, page 4.)

BOUQUETS. Arrange your flowers into pretty bouquets. Different children may bring fresh bouquets each day to keep in the school room. Be careful not to crowd too many into one bowl or one vase? When gathering them, it is best to use scissors to cut the stems. Cut the stems rather long. If they are too long for your vase, you may cut a piece off. It is best to keep the same kind of flowers, or at least the same colors, together. Place some green leaves in the vase with the flowers.

CHAPTER II

CLIMBING PLANTS

DISCUSSION. Some of our flowering plants are climbers. Their stems do not stand up straight like those of the California poppy and the four-o'clock. They fall to the ground unless they find something to which they may cling. When we plant climbers in our flower gardens or in our yards, we always place something near the plants for them to climb. Who of you have raised sweet peas? What do you arrange for them to climb on? Name some other climbing plants that you have at home. (Notebook, page 6.)

MORNING GLORY. The morning glory is an interesting climber to study. Who of you have some of these plants at home? Where are they growing? How high are they?

OUTDOOR OBSERVATION. How does the morning glory climb? Perhaps your class may go out doors to observe the plants. If not, you may observe them at home and report what you find.

When you look closely, you see that the stem of the morning glory wraps itself around some support. We say it twines around the support so we call it a twiner. Sometimes you will find a number of the stems twined around each other. Are the stems thick or slender? Morning glory stems grow so very long that they can not grow thick. They are thin and weak. That is the reason they must



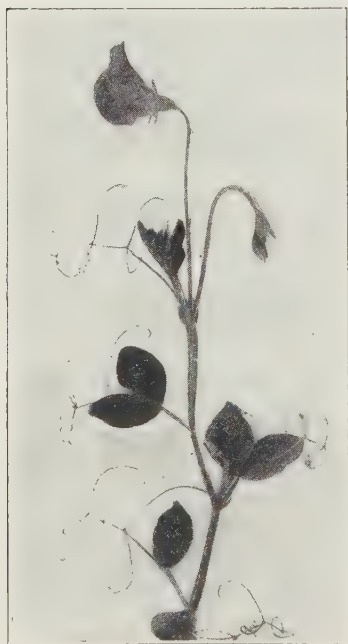
TWINING STEMS OF A WILD MORNING GLORY.

have something to which they may cling. (Notebook, page 6.)

THE LEAVES. Where on the stem are the leaves? Notice how they grow out from the support so that most of them get into the light. What is the color of those that are hidden from the light? When leaves cannot get light they turn yellow and soon die. What is the shape of a leaf? This form of leaf is heart-shaped. Draw and color one. (Notebook, page 7.)

FLOWERS. Where on the morning glory stems are the flowers? What different colors do you find? What is the shape of a flower? Find a flower that has not yet opened. This is the flower bud. Notice how it is twisted at the top. What color is it? Find a withered flower. How can you tell it from a flower bud?

If possible, look at the flowers early in the morning and again later in the day. What has happened? Why is morning glory a good name for this plant?



SPRAY OF SWEET PEA. NOTICE THE TENDRILS BY WHICH IT CLIMBS.

The flower of this plant opens very early in the morning just about the time the sun rises. It stays open until the sun is quite warm; then the bright colored part withers and curls up. The flower opens only one morning, so you will always find withered flowers on the stems. You will also find buds ready to open up the next morning. The green cup-like part of the flower and the part that is to grow into seeds remain on the stem. (Notebook, page 7.)

THE SEEDS. Look for the seed pods. What shape are they? Open one to find how many little rooms or apartments it has. How many seeds in each apartment? Try to find out how the pods break open to

scatter the seeds. Morning glories sow their own seeds. The pods burst and throw the seeds a short distance from the plant. These lie in the ground all winter and start to grow in the spring.

Perhaps you have seen the wild morning glory? This is a very bad weed that is sometimes found in corn fields and even in our gardens. Sometimes it almost covers the wire fences around the fields. It blossoms in the summer. It has a large white flower similar in shape to that of the garden morning glory.



LEAVES OF WOODBINE SHOWING THE FIVE LEAFLETS.

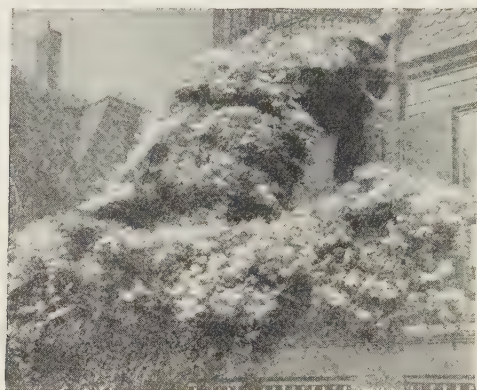
THINGS TO DO. Gather seeds for next spring planting. Mark the prettiest flowers by tying a string loosely around their stems. Save the seeds of these.

OTHER CLIMBING PLANTS. Look for other climbing plants in the neighborhood. Decide how each climbs. The sweet pea and some other plants climb by means of thread-like bodies that twist around a support. These are called tendrils. The plants are called tendril climbers. Look for plants that have tendrils.

You will find some vines that grow year after year, and produce new leaves and flowers each year. The grape vine is

one of this kind. Study this to see how it climbs. Find a wild grape vine. How does it climb? Some others of this kind are woodbine, clematis, Boston ivy, and poison ivy.

WOODBINE. Compare the woodbine or Virginia creeper with the grapes. What similarities do you find? What differences? You will notice that the fruit grows in the same kind of clusters as the grape. The leaf, however, is compound instead of simple. Each leaf has five leaflets. For this reason the plant is sometimes called five-leafed ivy. Besides its tendrils



A PORCH COVERED WITH WHITE CLEMATIS.

it sometimes sends out little rootlets along the stem which help it to climb. It belongs to the grape family. Watch for the beautiful colors of the leaves in autumn.

BOSTON IVY. The Boston ivy is a near relative of the woodbine. It has little discs on the ends of the tendrils that grow fast to any flat surface. Sometimes it covers entire buildings. It is very pretty and may be grown on stone or brick buildings. Because of the clinging discs it is not a good vine for wooden buildings.

WHITE CLEMATIS. Another pretty vine is the white clematis. No vine is prettier for a porch than this one. Decide what climbing plants you like best. Find pictures of them and mount in your notebook. (Notebook, page 8.)

POISON IVY. You may find another vine that clings to trees

and other supports. At first sight you may think it is the woodbine or five-leaved ivy. When you look closely, however, you find that it has three leaflets instead of five. This is a real pest and should not be allowed to grow anywhere, but especially not on home or school grounds. Many people are poisoned by simply touching the leaves. It is best not to go near it. For safety you should learn to recognize it. Sometimes poison ivy grows erect like shrubs instead of climbing.



A SPRAY OF POISON IVY SHOWING THE
THREE LEAFLETS.

CHAPTER III

VEGETABLE STUDIES

DISCUSSION. All boys and girls who think of things to do that help to keep them well and strong, eat some vegetables every day. Make a list of vegetables that you like. (Notebook, page 9.)

Vegetables are not only healthful kinds of food, but they are interesting plants to study. Among the most interesting are beans. Beans have helped to feed people for hundreds and hundreds of years.



A BEAN LEAF SHOWING THE THREE LEAFLETS.

There are a number of different kinds of beans. The most common kinds are string beans, lima beans, and navy beans.

Some bean plants grow in the form of little bushes, one or two feet high. They are called bush beans. Others are climbing plants. Like the morning glories, they must cling to some support. They are known as pole beans. Most of our string beans are bush beans. Some of them have green pods. Others have yellow pods. Lima beans

are sometimes called butter beans. Some limas are bush beans. Others are climbers. Navy beans are always bush beans. Look in seed catalogues for different kinds of beans. (Notebook, page 9.)

OUTDOOR OBSERVATION. Look at the bean plants in your garden. What kind are they? If they are bush beans, decide

how tall they are. If they are pole beans, decide whether they climb by tendrils or by twining. Collect some stems with leaves, and some pods from each for indoor study. If you can find them, get some green pods and also some ripe ones.

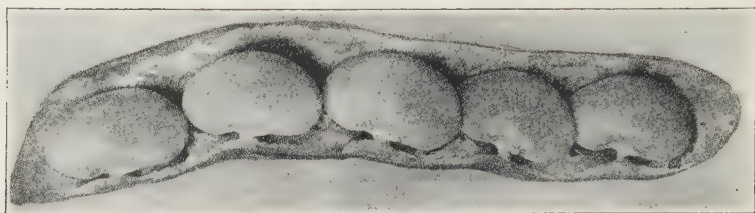
INDOOR OBSERVATION—LEAVES. Look at a bean leaf. How many parts has it? Each leaf-like part is a leaflet. Are the leaflets all the same size and shape? If you have different kinds of beans lay a leaf of each upon your desk, look at them and decide how they differ. Draw one of each. (Notebook, page 10.)

PODS AND SEEDS. Look closely at a bean pod. Is it round or flat? If it is a green pod, open it and find the seeds. Notice the short stems by which they are joined to the pod. What shape are the beans? What color? How does a ripe pod differ from a green one from the same plant? How do the ripe seeds differ from the unripe ones? How do the pods of lima beans differ from those of string beans or from those of navy beans? How do the seeds differ from each other? Draw a pod and seed of each kind. (Notebook, page 11.)



OPEN POD OF STRING BEANS. HAND WORK
DONE BY A PUPIL.

BEANS AS FOOD. What part of a bean plant is used for food? When you eat string beans, what part do you eat? What part do you eat when you eat lima beans? When string beans are young, we eat both pods and seeds. The young pod is tender and thick and the seeds small and juicy. The pods are broken or cut into pieces and cooked. As the pod grows larger it becomes thinner and drier and is no longer good to eat. The seeds, too, grow larger. For a while they remain rather soft and may be shelled and cooked. Then pods and seeds both become dry and the seeds are ripe.



A POD OF LIMA BEANS. NOTICE HOW THE BEANS ARE JOINED TO THE POD.

LIMA BEANS. When you eat lima beans you eat the seeds only. The pods are never tender enough to eat. Lima beans may be shelled and eaten while the seeds are still soft and tender. They may also be shelled and eaten after they become ripe and dry.

NAVY BEANS. Navy beans are always eaten dry. They are the small white beans that are found in the market all the year round.



BEANS GROWN IN A CHILD'S OWN GARDEN.

WAYS TO SERVE BEANS. Think of all the different ways in which beans may be served at the table. String beans may be cooked and creamed, or they may be buttered, or scalloped, or made into a salad. When they are shelled green they may be cooked with sweet corn and made into a dish called succotash.

Lima beans may be creamed, buttered, or baked.

Navy beans may be stewed, baked, or made into bean soup.
(Notebook, page 11.)

Beans are among the most wholesome foods. They supply you with the same kind of food material that is found in meat and in eggs. It is a building food and is quite as good for you as meat. Dry beans have more building value than green beans; but any of them are good food that every one should learn to eat.

CHAPTER IV

HEALTH

DISCUSSION. Every fourth grade boy and girl should be well and strong. You do many things every day without thinking much about them, that help to keep you in good health. You play or work out of doors in the fresh air and sunshine. You run until you are tired and then sit down to rest. You drink plenty of water. You sleep long hours. Perhaps you can think of other healthful things you do. (Notebook, page 12.)

One way that parents and teachers have of finding out whether you are up to standard in health is to take your weight and measure your height every month, or at least once in two months. (Notebook, page 13.)

Every child should weigh a certain number of pounds for his age and his height. For example, if you are a boy nine years old and if you are forty-eight inches tall you should weigh about fifty-three pounds. If you are a girl nine years old and forty inches tall, you should weigh fifty-two pounds. A pound or two more or less than the standard weight need not trouble you; but if you are much under weight, there is some reason for it and you should try to find out what the reason is. Then you should set about trying to bring your weight up to standard. If you are much overweight it may help to exercise more, or to eat less. It is not very bad to weigh too much if you are well.

Here are several things that may prevent your weighing as much as you should:

1. You may not eat enough nourishing food.
2. You may not eat the right kinds of food.
3. You may not eat at regular times.
4. You may drink too much tea or coffee and not enough water.
5. You may not get enough fresh air.

6. You may not sleep long enough hours.
7. Your teeth may be in bad condition.
8. Your tonsils and adenoids may be enlarged.

Here is a set of health habits or rules that children all over the country try to follow. You probably have been trying to keep some of them in the lower grades.

HEALTH HABITS

1. Clean person:
 - Hands, nails, face, ears.
 - Clean clothes.
 - Clean handkerchief, properly used.
2. Playing or doing light work a part of every day outdoors.
3. Good standing and sitting postures.
4. Leaving off heavy sweaters and coats when temperature is 68 degrees or over.
5. A full bath at least once a week.
6. Brushing teeth twice daily.
7. Sleeping about 10 or 11 hours with windows open.
8. Milk twice and at least four glasses of water every day, but no coffee nor tea.
9. Eating a variety of foods and some fruit or vegetables every meal. Eating at regular times.
10. A bowel movement every day.

Look through the list of rules and decide which ones you had better try hardest to keep. With the help of your teacher and parents, choose two or three that you think might help to bring your weight up to standard. Write the rules you are trying to practice. (Notebook, page 13.)

Foods. Probably rule 9 is one of the best to put into practice at the beginning of the year. The rule says, "Eat a variety of foods." There are good reasons for doing this. Some foods help you to grow. They are milk, meat, eggs, and cheese. Some foods help to keep the body warm and to give energy. They are breakfast cereals, bread and butter, potatoes, rice and



EAT SOME VEGETABLES EVERY DAY.

hominy. Foods that help most to keep the body in good running condition are fruits and vegetables.

You should eat some of each kind of food at every meal.

This is what we mean by "a well-balanced meal." (Notebook, page 14.)

Name some foods that are good for breakfast. What kinds of breakfast cereals do you like best? Cooked breakfast foods have more food value in them than the prepared ones, such as puffed rice and corn flakes; but if you like these better, they are very good for you if eaten with cream or milk and a little sugar. Name some fruits that you like for breakfast. Besides fruits and cereals, bread and butter, eggs and milk are good foods for breakfast.

Think of some good foods for dinner. Dinner is the meal at which meat is usually eaten. Then there may also be potatoes, or rice, or macaroni. There also should be a cooked vegetable such as carrots, peas, beans, tomatoes, or cabbage. For dessert, fruit and cookies, puddings, and occasionally ice cream, are good.

For lunch or supper, you may have a vegetable soup with crackers, and some milk toast, or whole wheat bread and butter, with honey or some other sweet. Cottage cheese and creamed potatoes are also good foods for lunch or supper.

Plan a good breakfast, a good dinner, and a good supper. Put in the foods that are good for you, whether you like them or not. (Notebook, page 14.)

CHAPTER V

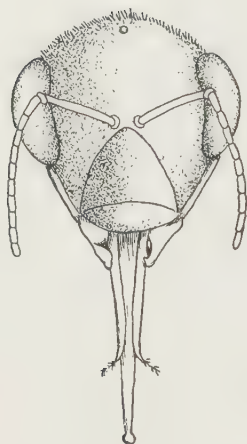
HOMEMAKING INSECTS—BEES

DISCUSSION—BEES. I wonder if you know that some insects make homes and live together much as people do? Honey bees are perhaps the best known of our home-making insects. Sometimes they make their homes in hollow trees or logs, sometimes in old buildings; but usually they live in hives. If you have ever seen a bee hive, I am sure you enjoyed watching the bees flying about, some going into the hive, others coming out of it. Think of other places where you have seen bees.



CAPTURING A BEE IN A JELLY GLASS.

OUTDOOR OBSERVATION. Look on flowers in your yard and garden for bees. Slip up very quietly to watch one. What is it doing? You will probably see it going head first down into a flower. Soon it comes out and goes into another flower. You will see its wings moving and you may hear them buzzing. Bees make their buzzing sounds with their wings. Sometimes, if the bee is moving about on top of a flower, you may see a yellow ball on each of its hind legs.



THE HEAD OF A HONEY BEE. NOTICE THE LARGE EYES AND THE FEELERS. AT THE LOWER PART IS THE LONG TONGUE READY TO PUT INTO A FLOWER TO GET THE NECTAR.

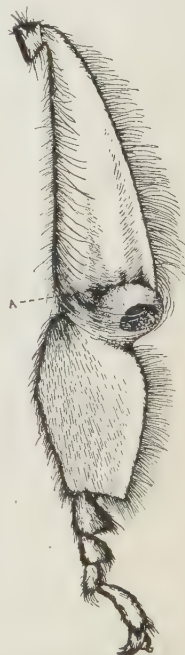
Capture a bee for indoor study. To do this you will need a glass with a tin cover. A jelly glass serves well for this. Hold the glass in your left hand, the cover in your right hand. Now slip the glass carefully over a flower that has a bee on it. Place the lid quickly on the glass and press it down hard enough to break the stem of the flower. Now you have the bee and the flower in the glass.

INDOOR OBSERVATION. Look at the bee a few minutes through the glass. What do you see? Count the number of legs. Count the wings. At first you may not see that it has four wings, two on each side. The hinder one is quite small and when the bee

flies, it hooks the two wings on each side together so that they look like one large wing.

Look for the big eyes at the sides of the head. Notice the feelers. They are fastened to the front of her head. They are bent like elbows. The bee may stick out her shiny brown tongue for you to see. When the tongue is not in use, she keeps it tucked back in a little groove on the under side of her head.

Notice the hairs on the body. What color are they? Look for hairs on the legs. Look at the picture of the hind leg on this page, and notice the stiff hairs marked A. These surround a little dent that you can see. When the bee is collecting pollen she puts it into the dent and the hairs help to hold it while she carries it to the hive. This dent is called her pollen basket.



Redrawn from Wheeler
THE HIND LEG OF A BEE. NOTICE THE DENT SURROUNDED BY STIFF HAIRS. THIS IS THE POLLEN BASKET. IT HAS A LITTLE POLLEN IN IT.

You may wonder where the bee keeps her sting. It is in a little case or sheath in the back part of her body. You cannot see it. Perhaps you have been stung by a bee and know how it feels. The sting is sharp and has little barbs on it that hold it fast in the flesh. When the bee stings you, she not only pierces the skin; but she puts a drop of poison into the wound. That is why it hurts so. Bees sting only in self defense. (Notebook, page 17.)

When you are through observing the bee, take the cover from the glass, out of doors or at an open window, and allow the bee to fly away. If you keep it too long in captivity it will die.

NECTAR AND HONEY. If you could see a bee's head when it is hidden in a flower, you would see the bee stick out her tongue and move it about until it touched a drop of sweet nectar. Then she would lick up the nectar, and suck it into her mouth through a tube-like sheath which is around her tongue. The nectar goes into her crop which is a little bag sometimes called her honey-sac. When the sac is filled with nectar, the bee flies away to the hive. While the nectar is in her crop, it is mixed with some juices which change it to honey. When the bee reaches the hive, she uses some muscles of the crop to squeeze the honey back into her mouth, then with her tongue she puts it into a cell made of honeycomb.

The bees do not squeeze all of the nectar back into their mouths. A little passes into the stomach and is used for food. Besides the nectar, bees eat all the pollen they wish when they are working on the flowers.

BEE-BREAD. The bees do not put honey into all the cells they find empty. You know they gather pollen as well as nectar. They mix a little honey with the pollen. This makes a dark looking substance called bee-bread. Many of the cells are filled with this food. The working bees eat more bee-bread than honey.

HONEYCOMB. Get a small box of honey from the grocer or from someone who keeps bees. Look at it closely before you take it out of the box. You will see the honey cells that

are called honeycomb. When they are perfect, they are six-sided. Notice that there is a little cap over each. In fact the comb is often smeared over a number of cells so that you cannot tell one from the other. Cut the comb and the honey out of the box by running a sharp knife along the sides. Allow the honey to drop down upon a plate. You can now see the shape of each cell. You can also see that the bottoms of the cells fit together at the middle line of the box. You may see too that the cells are tipped upward a little. The bees do this to keep the honey from running out before they have placed the caps over the cells. Notice how very thin the walls of the cells are.



(After Nolan)

THE DIFFERENT FORMS OF BEES FOUND IN ONE FAMILY.

How COMB IS MADE. You may wonder where the bees get the wax to make the comb. That is a very interesting story. When the bees need some new wax, a number of them eat a very hearty meal of honey. In fact, they eat and eat and eat until they can eat no more. They are then very sleepy, so they hang themselves up and go to sleep. You would like to see them do this. A number hang themselves to the top of the hive. They cling by the sharp claws on their front feet. Then other bees cling to the first ones by holding on to their hind legs. Here they all stay keeping very quiet while the heavy meal is digesting. Some of the food changes into a thin liquid wax. It oozes out of the body through little pores on the under side. Here are a number of little pocket-like depressions into which the wax flows and hardens. The bees take the wax

out of these depressions with scissors-like tools which they have on their hind legs.

The bees then put the wax into their mouths, moisten it with saliva, and chew it until it is soft and will bend easily. It is then ready to stick on the hive and mold into six-sided cells. The bees use their claws, their jaws, and even their tongues in making the smooth six-sided honey cells.

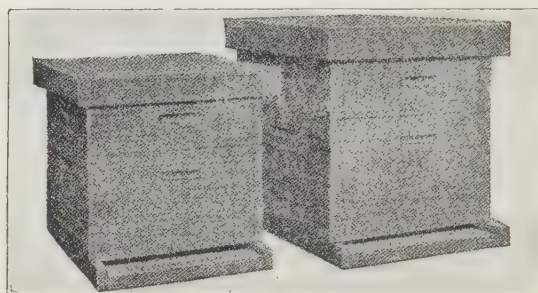
THE HONEY-BEE FAMILY. Each hive or home has in it three kinds of bees. Those that you see gathering nectar and pollen from flowers are called workers. There is always a large number of workers in every hive. As you may imagine from their name, they do all the work. Some gather nectar and pollen. Some make wax for honeycomb. Others feed the young bees, or do anything else that needs to be done about the hives.

Besides the workers, every hive has a queen, and a number of drones. The queen is the mother bee. Her chief work is to lay eggs. She is loved very much by the workers. If anything happens to her, the workers cease to work and the home is broken up. The queen is very much larger than a worker. The drones are the father bees. They fertilize the eggs by putting a fluid over them that makes them hatch.

YOUNG BEES. Young bees do not look at all like grown-up bees. Like all other insects, each begins life as an egg. The mother or queen places one egg in each empty cell that the workers have made ready for this purpose. She lays a great many eggs every day, sometimes as many as two or three hundred. Three or four days after an egg has been laid, it hatches into a little white worm-like creature. We call it a larva. As soon as it hatches, it is taken care of by some workers that are called nurses. A nurse eats some honey. It is changed in her crop into bee-milk. She then puts her head down into the cell where a tiny larva has just hatched. She puts some of the bee-milk into its mouth. She does this many times a day so that the larva grows very rapidly. After two or three days the nurse feeds the larva on bee-bread instead of bee-milk.

When the larva is about ten or twelve days old, it has grown so big that it almost fills the cell. Then the nurse gets some wax and closes up the cell. The larva spins a little silk covering over its own head. Then it sheds its larva skin and is changed into a new form which is called a pupa. The pupa stays very quietly in the cell, not eating and not moving about. In a few days it comes out a full-grown worker bee ready to help in the home.

SWARMING. I wonder if you have ever seen a swarm of bees. When there is a very large number of bees in a hive, one larva is fed during all of its life on bee-milk and it grows



TWO COMMON BEE HIVES. THE BEES GO IN AND OUT AT THE OPENINGS NEAR THE BOTTOM.

into a queen instead of into a worker. Then the old queen in the hive and a number of the workers leave the home and go forth to start a new one. They fly together in a great drove and finally settle down on some object, clinging to each other. They form a great mass of bees, much larger than your head. This is called a swarm. If they are shaken into a hive, they settle down and make a new home. The new queen now becomes ruler of the old hive.

Bee keepers know by the way bees behave when they are about ready to swarm. So instead of allowing the bees to fly away, the keeper takes the old queen out of the hive with some of her followers, puts them all into a new hive to start another home. (Notebook, page 18.)

HEALTH—SWEETS. Honey is one of the most healthful of the very sweet foods. Bread and butter with honey makes

a very good dessert either for dinner or for lunch. Name some other sweet foods such as sugar, candy, preserved fruits. Which of the sweet foods do you like best? Which ones are usually eaten at a meal? Which are often eaten between meals? Name some kinds of candy that you like. Who of you make candy at home? Why is this candy the very best kind?

Home-made candy is always best because it is made out of pure wholesome materials. It is also less expensive than good candy which is bought at the store. Which do you think is the better plan—to buy pure candy that costs more, or to buy impure candy even though you get more of it for your money? (Notebook, page 18.)

CANDY. Candy is a good food. The trouble is that most children eat too much of it, and eat it at the wrong time. When you eat candy between meals, it takes away your appetite for other foods that you need at meal time. The first thing you know you are losing weight and losing energy. You do not feel like vigorous work and play. The best time to eat candy is at the close of the noon meal or of the evening meal. Keep your candy to pass to the whole family at the close of dinner, lunch, or supper. You will all enjoy it at this time and there will be little danger of its having any bad effects.

CHAPTER VI

BUMBLE BEES

OBSERVATION. Look on flowers for bumble bees. Watch one as it goes down into a flower. What is it doing? Try to capture a bumble bee in a glass as you caught the honey bee. Sometimes in the fall bumble bees go to sleep on the flowering heads of thistles and on other flowers. If you find them here you may easily capture them.

Is the bumble bee larger or smaller than the honey bee? What is the color of the hairs on its body? How many legs has it? Notice that the wings are dark in color instead of clear like those of the honey bee. (Notebook, page 21.)

STORY. You may wonder where bumble bees make their homes. If you were to follow one of them to her home you would probably find it in a meadow under a tuft of grass. If you could look into the home, you would find a queen or mother bee, a few drones or father bees, and a large number of workers. Their home is started in the spring by the queen. She sleeps all winter. When she awakens, the first thing she does is to look for something to eat. You may be sure she is very hungry after her long winter fast. She settles down upon one flower after another and sips nectar until she has had quite enough. Then she starts out to hunt for a spot in which to make her home. She tries to find a little hollow in the ground under a tuft of grass. She often chooses the old nest of a field mouse. When she has found a place that suits her, she cleans out all the dirt so the inside is nice and smooth. Then she goes to flowers to gather pollen. She fills her pollen-baskets full of it and carries it to her home. She goes back and forth from flowers to the home all day long. She places the pollen in little balls and mixes some nectar with it. She then lays an egg on each mass of pollen. The eggs hatch into little white larvae, as those of the honey bee do. The larvae feed upon the pollen and nectar. When they are grown up each larva spins

a silken cocoon around itself and changes to a pupa. A little later the pupa changes to a full-grown bee. This is a worker bee. In fact all the bees that hatch in the spring and early part of the summer are workers. They are only about one-half as large as the queen bee.

The bumble bee workers go out to gather pollen and nectar and pile it up in the home. The queen stays at home most of this time and does nothing but lay eggs. Soon there is a large family of workers. Besides gathering pollen, some of them gather nectar and make it into honey. They do not make comb as the honey bees do. Instead, they clean out the empty cocoons from which the young bees have hatched and fill these with honey. Late in the summer some of the eggs hatch into drones and queens. When cold weather comes, the workers and the drones die. The queens seek a cozy corner in the grass or under a pile of brush, snuggle down, and go to sleep for the winter.

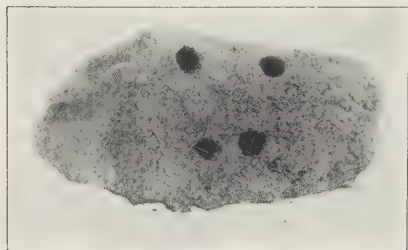
If you can find a field of red clover in blossom, you are almost certain to find many bumble bees hovering over it. You will see them dive down into one flower after another to get the nectar. Pull out one of the little clover flowers, put the end of it into your mouth and suck it. You will find for yourself how sweet the clover nectar is. As the bees go from one clover flower to another the hairs on their body become covered with yellow pollen from the clover. When they go to other clover flowers, some of the pollen is dusted off upon these. This pollen is necessary for the clover to make seeds. You see then that the bumble bees are real friends to farmers who raise clover. If it were not for them, there would be very few clover seeds.

CHAPTER VII

MUD WASPS

DISCUSSION. Where have you seen wasps? What do you know about the homes of wasps? Some wasps dig tunnels in the ground and live in these. Some make homes out of mud which they plaster on the inside of sheds, barns, and other buildings. Sometimes they put these mud homes on leaves or stems of plants. Some wasps make paper homes. (Notebook, page 23.)

OUTDOOR OBSERVATION—MUD DAUBERS. Look over the roofs of sheds, of barns or other buildings for the homes of mud daubers. What shape are they? Are they all the same size?



THE HOME OF A MUD DAUBER. NOTICE THE OPENINGS FROM WHICH THE WASPS HAVE COME OUT.

With a knife, carefully remove one of the homes and bring it in to study.

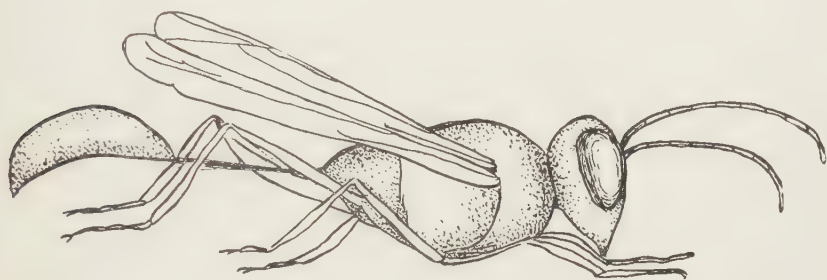
INDOOR OBSERVATION. Look closely at the mud home or nest. What do you see? Look into one of the holes. You see it opens into a tube-like cell. Thrust a piece of match or a toothpick into the cell to see how deep it is.

Carefully break open one cell. Is it smooth or rough on the inside? How many cells are there in the home? You may find in some of the cells a brown silky lining.

Make a drawing of the home showing the openings into the cells. (Notebook, page 24.)

STORY. The mud dauber's home is made by the mother wasp. She sleeps all winter just as the bumble bee does. In the spring when she awakens, she hunts for a spot where she may build her home. Then she goes to a pond, a pool, or some other place where she can find mud. She mixes a bit of mud up as a larva, it spins a brown silken cocoon around itself

with saliva from her mouth and puts in a few hairs or plant fibers that she finds on the ground. Then she rolls it up into a ball and carries it off to the spot she has chosen for her home. With her jaws she plasters the mud upon the board or rafter. Then away she flies for another ball of mud. She makes the cell very smooth on the inside. She builds it up layer after layer. Sometimes you can see just where she has placed each new layer. When the cell is about an inch long it is large enough.



A MUD DAUBER WASP.

The wasp then goes to the garden or to shrubs. She searches until she finds a little spider. She springs upon it and stings it. The spider is not killed by the sting. It is only paralyzed. It can move slightly. The wasp then carries it away and puts it into her cell. She then goes out and looks for another spider. She does this until the cell is almost filled with the spiders. Then what do you suppose she does? She lays an egg on one of the spiders. Then she goes to the pond and comes back with a ball of mud. With this she closes up the opening into the cell. The egg and the spiders are shut up inside. She does not give the cell any more attention. Instead she starts another one by the side of the first. When it is done, she fills it with spiders in the same way. Sometimes she makes eight or ten cells side by side.

You are wondering what happens inside of the closed cell. In a few days the egg hatches into a little worm-like larva. It feeds upon the spiders and grows rapidly. When it is grown

and changes into a pupa. In a few days the pupa becomes a wasp. With its sharp jaws it cuts a hole in the end of a cell and comes out ready to make a mud cell for itself. (Note-book, page 24.)

In some of the cells you may find the remains of spiders. Once in a while you may find a pupa.



HOMES OF A MUD WASP MADE IN THE FORM
OF WATER BOTTLES.

If you keep on the look-out around pools of water during the summer, you will probably find mud daubers making their plaster. They are more slender than bees. Some kinds are bluish black in color. Others are brown with bands of yellow.

OTHER MUD WASPS. You may find some homes of mud wasps that are in the form of little water-bottles with wide bottoms and narrow necks. One young wasp is reared in each mud bottle. Sometimes a number of these mud bottles are placed side by side on a leaf or stem.

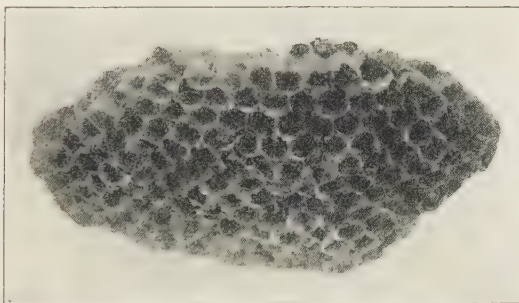
CHAPTER VIII

PAPER WASPS

DISCUSSION. You may find on the ceiling of your porch, or under the eaves of the house, or perhaps hanging on the under side of a twig, the home of a paper wasp. This wasp is called *Polistes* (Pō līs' tes). In the fall *Polistes* wasps often come into our homes and buzz around on the window panes. They are searching for cozy corners in which to settle down to spend the winter.

OBSERVATION. If you can find the home of a *Polistes* look at it closely. What do you see? How is it attached to the building or other support? If possible, bring one in for study.

How many cells are there in one home? How deep are the cells? What shape are they? Draw some of the cells. (Note-book, page 23.)



THE PAPER NEST OF A POLISTES WASP.

STORY. As you see, the cells of the *Polistes* home are made of stiff gray paper. You wonder where the wasp gets the paper. She makes it.

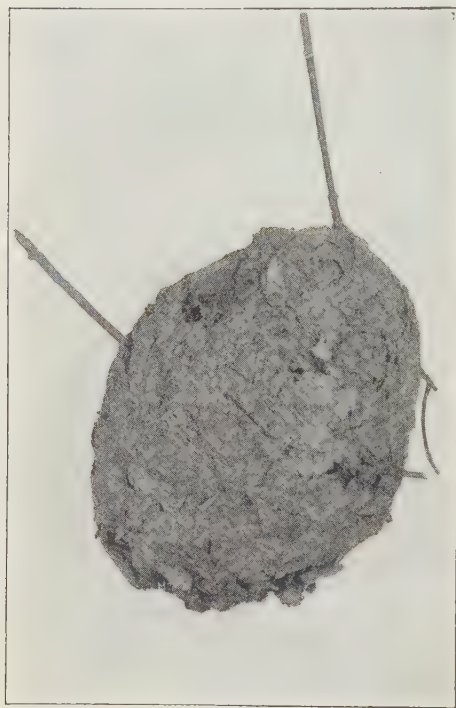
When the *Polistes* awakens in the spring after her long winter nap she at once decides where she will build her home. Then she finds some old unpainted boards, or sticks, or stumps. With her jaws she scrapes off bits of the board. Then she chews and chews and chews them, mixing them with saliva. At last they become very soft pulp. With this pulp she starts a cell.

She spreads it out with her jaws. It dries into thin gray paper.

She makes more paper and builds up the cells as you found them. When she has finished a cell she puts an egg far up in the end of it. She fastens it there with a little glue that she has in her body. (Notebook, page 23.)

The eggs hatch into tiny larvae. They hang head downward in the cells. They cannot fall out for they are stuck fast at the hinder part of the body.

When there are young wasps to look after, the mother does



NEST OF A HORNET. THE ENTRANCE IS AT THE
BOTTOM.

not make any more cells. Instead she spends her time feeding the larvae. She captures flies and mosquitoes, and snips off their hard legs and wings. Then she chews the bodies until they are almost as thin as milk. She puts her head into a cell and places this food in the mouth of the larva. The larvae grow rapidly and in less than a week they do not need any more food. They cover themselves with cocoons and change into pupae. In a few days, the pupae become grownup wasps. They are all workers and begin at once to help their mother. They make new cells in which the mother places her eggs.

When the eggs hatch into larvae the workers feed them.

HORNETS AND YELLOW JACKETS. The most interesting paper wasps are hornets and yellow jackets. Hornets are a little larger than honey bees. They feed upon mosquitoes, flies, gnats, and other insects that they catch on the wing.

A hornet's nest is a wonderful piece of workmanship. If you have one in your nature collection, notice the gray paper case. You find that this is made of a number of layers of thin gray paper. Toward the bottom, there is an opening through which the hornets may pass in and out. If you could



A HORNET'S NEST WITH PART OF THE PAPER CASE
REMOVED TO SHOW THE CELLS ON THE INSIDE.

look on the inside, you would find hundreds of cells that are arranged in plate-like layers, one above the other. The cells, as well as the case, are made of paper. The paper is made by the hornets. They chew up bits of unpainted boards, bits of bark, and dead leaves, just as the *Polistes* wasp does.

The mother hornet starts the home in the spring. She builds from four to six cells and covers them with a small paper case.

This is about as large as your fist. She lays an egg in each cell. When the egg is hatched, she feeds the larva on flies and other insects.

After a few days the larvae spin cocoons around themselves and change into pupae. A few more days, and they come out of the cells grownup hornets. They are all workers and at once set about helping their mother. They enlarge the paper case. They make more cells and they feed the young. This goes on all summer. The nest becomes quite large, sometimes much larger than a man's head. Think how very busy these little creatures must be to chew up enough wood fiber to make



A HORNET AS IT LOOKS WHEN FLYING

the yards and yards of paper that they need for their cells and their paper cases.

I wonder whether you know that much of the paper that we use in books and newspapers is made from wood pulp. The wood of trees is cut up into small pieces. Then it is soaked in a liquid that softens it. After this it is ground up into pulp, spread out, dried, and made into sheets of paper. Long before men knew how to make paper in this way, the paper wasps had learned the secret of making paper out of wood.

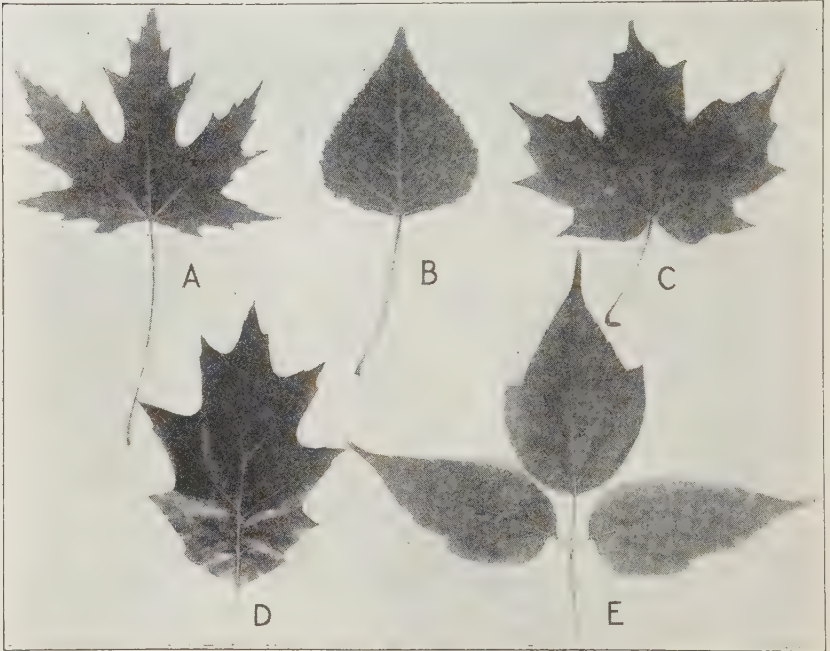
Yellow jackets are much like hornets. They usually make their cells in hollows in the ground, in brush piles, or in meadows under clumps of dead grass. Sometimes when farmers are

cutting their meadows to make hay, the homes of the yellow jackets are disturbed. The wasps come out and sting the horses often causing bad runaways. Perhaps you have seen yellow jackets when you have been having a picnic in the woods. Often they gather around while you are eating and try to help themselves to your jellies and jams. If you do not disturb them, they are quite friendly. If you try to drive them away, they may become angry and try to sting you. While they like fruit juices, they feed, for the most part, upon flies and mosquitoes. You see then, that both hornets and yellow jackets are very helpful insects. (Notebook, page 24.)

CHAPTER IX

TREES

DISCUSSION—REVIEW. Name some different kinds of trees that you know. If you have studied trees in the lower grades, you should know at least four or five kinds. Look at the



SOME COMMON TREE LEAVES. A, SILVER MAPLE; B, CAROLINA POPLAR; C, SUGAR MAPLE; D, RED OAK; E, BOX ELDER.

pictures of tree leaves on this page. Cover up the names at the bottom and then see whether you can give each its correct name. Bring to school a leaf of each of these trees. Lay them upon your desk. How can you tell the silver maple from the others? How can you tell the sugar maple from the poplar? How can you tell the box elder from the others? How can you tell the red oak?

FOREST TREES. You often go to the woods to play or to have a picnic, or for some other reason. What trees in the

woods do you know? We call trees that grow in the woods forest trees. All the trees together make the forest. When we set out forest trees on our home grounds or in the school yard, we usually call them shade trees or ornamental trees. All of the trees whose leaves you have brought to school are forest trees. (Notebook, page 25.)

DISCUSSION. Some forest trees bear pods similar to those of beans or peas. Perhaps you have some pod-bearing trees in your yard at home. You may have seen some of them in parks. One of the most common of these trees is the honey locust. Another is the common or yellow locust. Then there is the red bud, the Kentucky coffee tree and the yellow wood. (Notebook, page 27.)

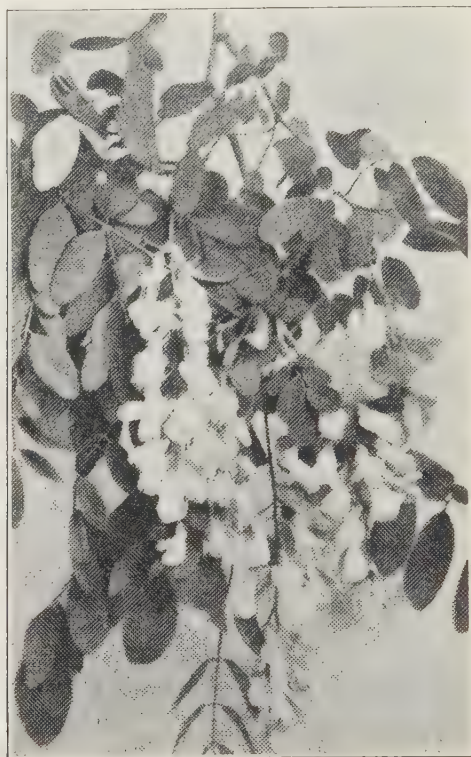
OUTDOOR OBSERVATION. Find a honey locust. Notice the bark. What color is it? Is it smooth or rough? Stand under the tree and look through the branches. Notice how fringy and fern-like the leaves are. This is what makes this tree so beautiful. Some honey locusts have large brown thorns growing close together on the branches and upon the trunk. Others do not have many thorns. Nurserymen who keep locust trees for sale raise the kinds that do not have thorns. They know that people do not like to have trees with sharp thorns in their yards. Notice the pods on the tree. You may find that some of them have fallen to the ground.

If you do not have a honey locust, study a yellow locust instead. If you have both, notice how they differ. Collect some leaves and pods for indoor study.



COMPOUND LEAVES OF LOCUST TREES. THE ONE TO THE RIGHT IS THE COMMON OR YELLOW LOCUST. THE ONE TO THE LEFT IS THE HONEY LOCUST.

INDOOR OBSERVATION—LEAVES. Examine the leaf of a honey locust. Notice that it is a compound leaf. Count the leaflets. Are they large or small? How long is one entire leaf? Which is larger, the leaflets of the honey locust or those of the yellow locust? Draw a leaf of each. (Notebook, page 26.)



FLOWERS AND LEAVES OF THE COMMON OR
YELLOW LOCUST.

PODS. Look at the pod of a honey locust and tell everything that you see. Does it lie perfectly flat on your desk? How does the pod of the yellow locust differ from that of the honey locust? Draw one of each. (Notebook, page 26.)

SEEDS. Open a pod and find the seeds. How are they joined to the pod? What color are they? Compare them with those of the yellow locust.

STORY. You may wonder how the honey locust got its name. If you open a pod before it becomes dry and hard, you will find a gummy substance around the seeds. This is sweet like honey, so the tree is called the honey locust.

The yellow locust gets its name from the yellow tint of its wood. The wood of the tree is used for fence posts, for parts of ships, and for wooden articles such as vases, lamp stands, and candlesticks.

Locust trees blossom in May or early June. The flowers of the yellow locust are very pretty. They are cream colored and look very much like a cluster of sweet peas. They have a very sweet odor. The flowers of the honey locust are very small and greenish yellow in color. Unless you look closely you may not find them at all. They too have a sweet odor. Bees like to gather nectar from the flowers of locust trees.



POD OF THE HONEY
LOCUST.

CHAPTER X

OTHER POD TREES

RED BUD. I wonder whether you have red bud trees in your neighborhood, or in the forest near your home? They are small trees with very dark bark. The leaves are very different from those of locust trees, but the pods are quite similar.

If there is a red bud tree near your school, study it as you did the locust trees. Collect some leaves and pods for indoor study. Look at a leaf and describe it. This is a simple leaf. It is heart shaped. Draw a leaf and color it. (Notebook, page 28.)

PODS. How do the pods of the red bud differ from those of the locust? Open one and find the seeds. How many in one pod? (Notebook, page 27.)



POD OF THE
RED BUD

STORY. The red bud is very pretty early in the spring. It blossoms before the leaves come on the tree.

All the branches are covered with clusters of dainty rose-colored flowers. The flowers are the same shape as those of the sweet pea. The tree is a good one to set out in yards and parks.



LEAF OF A RED BUD.

KENTUCKY COFFEE TREE. The Kentucky coffee tree is one of the most interesting of the pod trees. It is found in the woods of most of the eastern and middle-western parts of the United States. Notice the very large leaves. Each leaf is so large that it looks like a twig with branches and leaves on each branch. These are really leaflets. It is a very large compound leaf. One leaf is often from two to three feet long and sometimes two feet broad. Measure

one with your ruler. When the leaves begin to drop in the fall, the leaf stems look like twigs on the ground. Draw a part of a leaf in your notebook. (Notebook, page 28.)

PODS. How do the pods differ from those of the other pod trees studied? How do the seeds differ. Draw one of each. (Notebook, page 28.)



POD OF A KENTUCKY COFFEE TREE.

STORY. The Kentucky coffee tree was named by the early settlers who came into Kentucky years ago. They found this tree in the woods with the large seeds in the pods. They thought it was a coffee tree so they ground up the seeds and used them in place of coffee. They did not like it as well as real coffee, so later when they could more easily get the real coffee from eastern markets, they gave up using the seeds of the coffee tree. The tree however still keeps the name and probably always will. (Notebook, page 28.)

All of the pod trees you have studied belong to the locust family. Sometimes this is called the pea family because the pods and the flowers are similar to those of garden peas and also of sweet peas.

CATALPA. The catalpa is another pod-bearing tree that you may find in your neighborhood. If you can find one, notice how thick each branch is. Where on the branches are the pods situated?



POD OF A
CATALPA TREE.

LEAVES. Describe a leaf. How long is it? How wide? Measure two or three. Draw a leaf. (Notebook, page 29.)

PODS. What is the shape of a pod? How does it differ from the others you have studied? Open a pod to find the seeds. Describe them. The fringy wings help the seeds to fly some distance from the tree. Draw a pod and a seed. (Notebook, page 29.)

STORY. Catalpa trees are very useful. The wood is tough and durable. Many farmers plant groves of catalpas. When the trees are large enough they are cut down and made into fence posts. This tree has very pretty flowers. Keep your eyes open next May or June and you will see them. This tree does not belong to the locust family. You see that it has a very different kind of pod and seeds.

PROJECT. In a flower pot or a box of soil, plant a few of the seeds of the catalpa. Do not plant them more than one-half inch deep. Keep them watered and watch for the appearance of the little trees. In the warm schoolroom they will grow in the fall. If you plant them out of doors they will remain in the ground all winter and grow into little trees in the spring.

GAME. One child in the class may stand and say, "I am a pod tree. My leaves are heart shaped. Which one am I, John?" If John knows, he goes to the board and writes the name. If he does not know, some child who does passes to the board and writes it. Very quickly another child stands and says, "I am another pod tree. I have very fine leaflets. Who am I?" Another child runs to the board and writes the name. This is continued until the names of all the pod trees are on the board.

The game may be changed in this way: One child steps to the board and points to the name of one of the trees. He says, "Who can tell me something more about this tree?" All who can, stand. The first one up tells what he knows. Another tells what he knows, etc. Then another child points to the name of another tree. This is continued as long as the children enjoy the game.

CHAPTER XI

SEED STICKERS

DISCUSSION. Plants have very interesting ways of scattering their seeds. Last year you studied some of the seed fliers. Name some of the fliers. Think of the dandelion, milkweed, and others. (Notebook, page 30.)

All of you, I am sure, have some time or other gone to the woods or out into the fields or even into vacant lots, and have come away with seeds sticking all over your clothing. This is the way these seeds have of getting far away from the parent



THE LARGE LEAFED BURDOCK PLANT

plants upon which they grow. As you carry them off, you pick them from your clothing, and throw them down upon the ground; you are really planting the seeds as you go. These seeds also cling to the fur of animals and are dropped and planted. Some people call them seed-tramps because they steal rides whenever they get a chance. The most common of the seed stickers are the burdock, the cocklebur, the sand bur, Spanish needles and beggar's lice. How many of these do you know?

BURDOCK. Look around your home and in vacant lots for burdock plants. You may find two kinds. One has a tall stem



TWO BURDOCK BURS. IN THE
CORNER IS ONE OF THE
SEEDS.

with many burs and a number of rather small leaves. The other one has very large leaves growing close to the ground in the form of a huge rosette and has no burs. Study one of the tall plants. How tall is it? Notice whether it has few or many branches. Notice the leaves of the low-growing plant. How do they differ from those on the tall plant? Bring in a branch of the tall plant with some of the burs for indoor study.

INDOOR OBSERVATION. Remove a bur and examine carefully to determine what enables it to cling to your clothing. Hold a branch up in its natural position. Then touch your sleeve to it allowing one of the burs to stick to the cloth. Does it come off right side up, or upside down? Look down into the center of the bur for the seeds. Take them all out and count them. Do all the burs have the same number of seeds? Draw a picture of a bur. (Notebook, page 32.)

STORY. Burdock is a common weed in vacant lots, fence corners, and shrubbery. The first year it grows from the seed and makes a low large-leaf plant. The second year it sends up the tall stem which blossoms and produces seed. Then the plant dies.

You now see why there are two kinds of burdock plants in the fall.

When the burs are ripe, they break off very easily. They usually cling with the upper portion of the bur downward so that the seeds may fall out one after another.

You may be interested to know that the burdock first grew in lands far away across the Atlantic Ocean. It was brought to the New World by the early colonists. Little by little, the plant has spread until now it is found in most parts of the United States. Another interesting fact about the plant is

that the roots are used to make a special kind of medicine. In many of the countries of Europe and in a few places in the United States the burdock is grown and the roots are dug up and sold to be made into medicine.

FLOWERS. You may find some burdock plants still in blossom. There are many little flowers grouped together into a head. They are a pretty pink-purple color.

HOW TO GET RID OF BURDOCK. We may get rid of burdock by cutting out the large leafed plant before it blossoms and bears seeds. It must be cut two or three inches below the surface of the ground. If it is not it will send up new stems. You may prove that this is true by some experiments: (1) Cut one plant off just at the surface of the ground. (2) Cut another two inches below the surface. (3) Cut a third still farther below the ground. (4) Cut the top off one and pour a little kerosene upon the root. Watch to see which ones die and which live.

THE COCKLEBUR—OBSERVATION. If you live in the country, you may find cocklebur plants in the fields. Sometimes you find them along the roadside. How tall are the plants? Describe a leaf. Collect burs for indoor observation.

OBSERVATION. What is the shape of a cocklebur? How does it differ from the burdock bur? Notice how stiff and strong the hooks are. Cut a bur open lengthwise. How many seeds are in it? What shape are they? Draw one. (Note-book, page 30.)

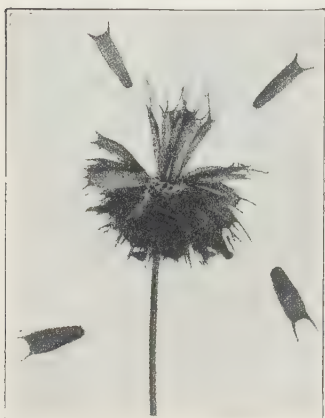
STORY. The cocklebur is a very troublesome weed. Its native home is in the countries south of the Gulf of Mexico.



(Courtesy Public School Pub. Co.)

A BRANCH FROM A COCKLE-
BUR PLANT. NOTICE THE
SHARP HOOKS ON THE BURS.

Each plant has a large number of burs. These burs are carried from one field to another on the hairs of animals and on the clothing of people. Each bur contains two seeds. One seed grows the first spring. The other seed does not grow for two years or more.



(Courtesy Public School Publishing Co.)

A CLUSTER OF SPANISH NEEDLES.
NOTICE THE PRONGS ON EACH
SEED.

BEGGAR'S LICE. Beggars' lice are small, round, greenish gray stickers that are not much larger than pin heads. You find them in the woods. The plants upon which they grow are quite low. So you are likely to get the burs in your stockings and on the lower part of your skirts or trousers.

Look closely at one of the burs. You find that it is covered with small whitish hairs that look like fuzz. These tiny hairs are covered with hooks

which stick tight to your clothing. You have a hard time to get them out.

SPANISH NEEDLE. You may find Spanish needles in vacant lots or along the borders of the garden or by the road side.

If you find the plant, look at the pretty brown heads sticking out in the tops of the branches. Pull one of the heads to pieces to find one of the seeds. Each flat seed has two prongs, like a fork, at one end. You may find seeds with three prongs. Look closely at the prongs to find the hooks or barbs with which the seed clings to clothing or other objects.

Spanish needles have many different names. Some call them pitchforks. Others call them sticktights. The name you will find in botany is bur marigold.



(Courtesy Public School Publishing Co.)

A SPRAY OF SAND BURS
WITH THEIR SHARP SPINES.

SAND BUR. One of the very worst stickers is the sand bur. The plant is a kind of grass that grows in sandy soil. The burs are round, with long sharp spines covered with hooks. They stick fast in your stockings and are so sharp that they are very annoying.

HANDWORK. You may make a chart of seeds that are stickers. Mount one of each kind on a sheet of cardboard or in a shallow box. You may make some very pretty designs out of the burs. Thick glue will hold them more securely to the cardboard than ordinary paste.

You may make some pretty little baskets by sticking together the burs of burdock or those of cocklebur.

CHAPTER XII

EXERCISE AND HEALTH

DISCUSSION. Exercise means doing those things that keep your body in good working condition. You exercise when you play, when you work, when you walk or run, or when you move any part of your body.

Rule 2 of your health habits says, "Play or do light work out of doors a part of every day." Have you ever thought why you should exercise?

1. Exercise makes your blood flow faster and your food digest better.
2. It makes you breathe more deeply.
3. It strengthens the muscles of your body.
4. It keeps your joints limber.
5. It helps you to stand and sit straight and in this way makes you appear well. (Notebook, page 33).

PLACE AND TIME TO EXERCISE. To get the most good from it, you should exercise at regular times every day. There is but one best place to exercise actively, and that is out of doors. You see why this is true. The outdoor air is always pure. You breathe faster when you exercise than when you are quiet.



PLAY OUT OF DOORS EVERY DAY.

Hence when you are exercising out of doors, you are always getting plenty of fresh air. If you play indoors, you should see that the windows are open and that the room is as full of fresh air as possible.

There are only a few times during the day when it is not good for you to exercise. You should not take very violent exercise just before eating. In fact if you are very hot or tired from running or playing, you should rest a short time before you eat anything. It is not a good plan to exercise im-



CHILDREN ENJOYING SWINGS ON SCHOOL GROUNDS.

mediately after eating. At this time much blood is needed in the stomach. When you exercise, much of the blood goes to the muscles. When you have been sitting still reading, studying, or sewing for an hour or more, you should take a few minutes for some kind of exercise.

FALL SPORTS. What games do you play at this time of year? Which ones do you like best? Which games make you run a great deal? Which ones keep you thinking hard so you will not make mistakes? Which ones make you think about your playmates so you will not lead them to make mistakes? In which games do you use your arms and hands? (Notebook, page 33.)

PLAYGROUND EQUIPMENT. Some schools have swings, slides, and other things for children's play. These are called playground equipment. Which ones of these are in your school?

THE SWING. What is a swing made of? What parts of your body do you use when you swing?

I wonder if you have ever thought that a swing is like the pendulum of a clock. The longer the swing is, the farther out it will move. Swinging is restful exercise. While it uses some of your muscles, one of its chief values is that you are



THE TEETER BOARD PROVIDES GENTLE OUTDOOR EXERCISE

moving rapidly through the air and are getting plenty of fresh air into your lungs.

THE TEETER. The teeter or see-saw also provides restful sport. What muscles do you use while teetering? What is the force that makes the teeter board go up and down? A teeter is a large balance with a weight on each end. If you and the person you are playing with are the same weight, you have the board resting at the middle. If one is heavier than the other, you slip the board so the heavier person will have a shorter part, that is, a shorter arm of the balance. Sometimes a third person stands at the middle of the board and puts more weight on the one side of the balance than on the other.

THE SLIDE. A slide is another kind of playground apparatus that many children enjoy. In this, it is the weight of your body that takes you down the slide. The longer the slide and the higher it is, the faster you go before you reach the ground.

Besides these, you have balls and bats, and you play numerous games that need no apparatus. While you play all these games for the pleasure you get out of them, it is worth while to remember that playing out in the air is one way to keep well and strong. At the same time it helps you to do better school work.



FOURTH GRADE CHILDREN HAVING A GOOD TIME ON A SLIDE.

You study better and are happier if you have plenty of outdoor exercise. Playing games with other children helps also to make you a good sportsman. A good sportsman plays fair, waits his turn, and does not get angry when he loses.

LIGHT WORK. Think of some kinds of work that you do at home in the fall. Here are some, and you will think of others: Harvesting the garden crops and storing them for the winter, feeding the chickens, cleaning up the garden and yard, setting the table, sweeping the floor, and making the beds.

Some work is quite as important for you as play. Every boy and girl should do some useful work every day. You need

this to make you a worthwhile member of the family and a good citizen.

“All work and no play, makes Jack a dull boy,
All play and no work, makes Jack a mere toy.”

(Notebook, page 34.)

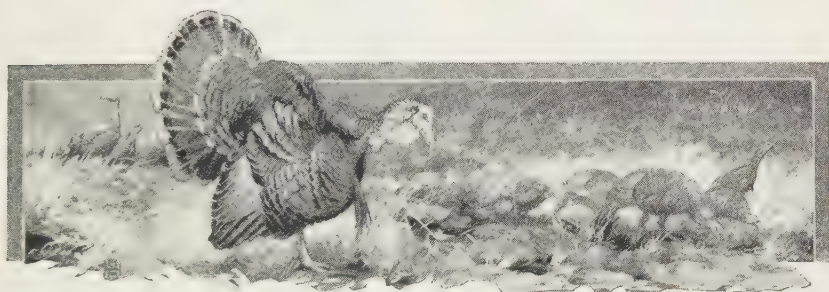
CHAPTER XIII

BARNYARD FOWLS

DISCUSSION. Barnyard fowls of some kind are raised in every country home. Some people who live in towns raise them also. Another name for fowls is poultry. What kind of poultry do you know? (Notebook, page 36.)

Tell some facts that you know about chickens, something that you know about ducks, and about geese. Perhaps some of you have guinea fowls. Tell something about them.

THE TURKEY—OBSERVATION. Who of you have seen a live turkey? What do you remember about its appearance? If you have turkeys at home, look at them closely. Perhaps the



(Courtesy of the *Nature Magazine*)

A FLOCK OF TURKEYS.

entire class may go to your home to see them. How can you tell the turkey hens from the gobblers? Which is larger? Look closely at a gobbler. Is the head bare or covered with feathers? Notice a knob-like projection on the top of the head just back of the bill. What different colors do you find in the feathers?

How many toes has the turkey? Notice the sharp claws.

Perhaps the gobbler will strut for you. How does he hold his tail when he struts? What else does he do? The picture on page 36 shows a gobbler strutting. What sounds do turkeys make? What do turkeys eat? Where do they roost? Who of you have seen turkeys' eggs? How do they differ from hen's eggs? If you have ever seen little turkeys, describe them.

THE STORY. Turkeys are natives of America. When the first colonists settled in the new world there were great numbers of wild turkeys in the woods. Many of them were killed and used for food. As you probably know, the Pilgrim Fathers ate turkey at their first Thanksgiving dinner. Even now many people think that no meat is quite so good for Thanksgiving as that of the turkey.

The early settlers in the country captured some of the wild turkeys, took them to their homes, and fed and cared for them until they became quite tame. The young of these turkeys were less wild than their parents. In a few years, turkeys became almost as tame as other barnyard fowls.

The male turkey, or gobbler, is much larger than the turkey hen. His head is beautifully colored in red, blue, and white. The knob on the top of his head often hangs down like a tassel over his bill. On his breast is a tuft of stiff hairs called his brush. His feathers are a shiny brown color called bronze. He is a very vain fellow. He often spreads out his tail, lowers his wings until they touch the ground, holds out his chest, fluffs up his feathers and struts around to show how handsome he is. Now and then he stretches forth his neck and gobbles two or three times.

The feathers of the turkey hen are not so shiny nor so prettily colored as those of the gobbler. In the spring when the time comes to lay eggs, each turkey hen slips away from all the rest of the flock. She hunts for a hidden spot where she can make her nest just as if she were a wild bird. She makes it upon the ground, using grass or straw or dry weeds.

The eggs are about twice as large as chickens' eggs. They are cream colored, speckled all over with dark brown spots.

When the turkey hen lays the first egg, she carefully covers it with grass and straw. When she puts in another, she covers this one also. After she has laid from twelve to fifteen eggs, she sits upon them to keep them warm. In four weeks, the dainty little turkeys hatch from the eggs. They are covered with thick coats of down, light tan in color with brown spots.

Turkeys eat corn, wheat, other grains, and weed seeds. They are also very fond of grasshoppers, crickets, and other field insects.

Turkeys do not like to roost in buildings as chickens do. Instead, they fly to the tops of trees and settle down with their heads toward the wind. They tuck their heads under their wings and do not seem to mind the weather, no matter how cold and blustering it may be.

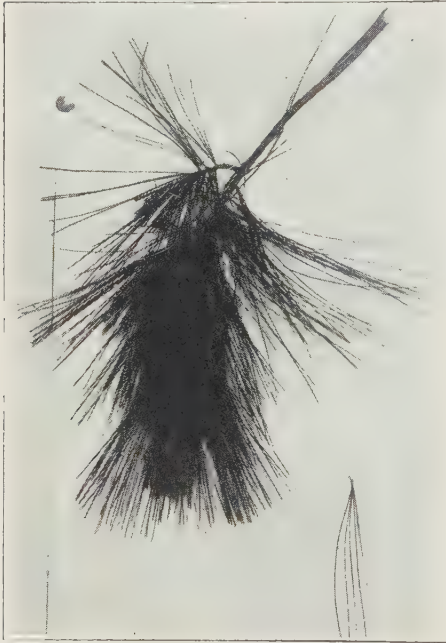
While most turkeys found throughout the country belong to the bronze group, some people raise other breeds. These are bright buff in color. A few are almost white. (Notebook, page 36.)

WINTER STUDIES

CHAPTER XIV

EVERGREEN TREES

DISCUSSION. Who of you have some evergreen trees at home? Who knows where there are evergreen trees in the neighborhood? Have you ever noticed that there are different kinds of evergreen trees? Some of them have long leaves. Some of them have short leaves. All of the leaves are very slender and are often called needles. Pine trees have longer needles than any of the other evergreens.



SPRAY OF A WHITE PINE.

PINE TREES — OUTDOOR OBSERVATION. Choose an evergreen tree near your school or home for study. If possible, select a white pine. Look at the tree. Each tell one thing you see. What is its shape? What is the color of the trunk? Can you trace the trunk or main stem to the top of the tree? Look at the tree so carefully that you can draw its shape or cut it out of paper when you return to the school room. (Notebook, page 39.)

What do you find on the ground under the tree? The brown needles or leaves on the ground tell you that little by little the tree drops its leaves. Not all the leaves drop off at the same time, so always the tree has some green leaves. That is why it is called an evergreen.

INDOOR STUDY. Bring in a few twigs or small branches of the pine. Look at the leaves. What shape are they? How long are they? Are they arranged singly or in clusters? How many in one cluster? Notice the little sheath that grows around the base of the cluster to hold the needles together. In the white pine you always find five needles in each sheath.

CONES. Perhaps you will find some cones on the ground under the white pine. Describe a cone. How long is it? What shape? The cone is the fruit of the tree.

Under the scales are the seeds. Each seed has a thin wing.



SPRAY OF A RED PINE.



A CHART SHOWING CONES OF DIFFERENT KINDS OF EVERGREEN TREES.

With this it flies far away from the tree. If you look closely you may find a few of the winged seeds tucked down on the inside of the scales. Draw a cone and a cluster of the leaves. (Notebook, page 40.)

OTHER PINES: When you have completed the study of the white pine, find other pines in the neighborhood. Notice the differences in the color of the bark, in the number of needles in a cluster, in the size and stiffness of the needles, and in the size, color, and shape of the cones. Draw a cluster of leaves and a cone of each kind of pine. (Notebook, page 41.)



A SMALL BRANCH FROM A
SPRUCE TREE.

THE STORY. The white pine used to be one of the most common evergreens in the eastern part of the United States and along the Great Lakes. Its wood made such good lumber that most of the white pines have been cut down and used. People are now beginning to plant seeds in the places where the trees have been cut down, to start new white pine forests.

In northern United States and in Canada, the red pine is found. It has two needles in a sheath. Its wood also makes excellent lumber.

If you live in the south, you find the yellow pines. These have very long needles, some of them a foot or more in length. These pines have three needles in a sheath.

In many yards, parks, and school grounds, you may find a few pines that have been brought to this country from Europe. They are used as ornamental trees, because they are very pretty. One is the Austrian pine. It has long stiff needles. There are

two needles fastened together in a sheath. The other is the Scotch pine. It also has two needles in a sheath; but they are much shorter than those of the Austrian pine. You can tell the Scotch pine from all the others by the yellowish red bark of the upper part of the trunk and the branches.

SPRUCES. You may find some spruce trees in your neighborhood. The needles of these trees are short, not more than an inch in length. They are stiff and sharp and pointed, and are arranged singly on the twig. Look closely at them and feel them with your finger and thumb and you will find that each is four-sided. Observe one of the spruce trees. Notice how it differs from the pines. Draw a small portion of a twig. (Notebook, page 41.)

Most Christmas trees that are shipped to us are spruces. Sometimes they have the pretty brown cones still clinging to their branches. Most of these trees are brought from northern United States and from Canada.

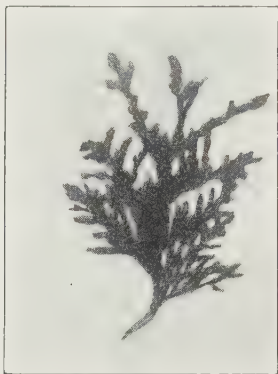
Study the Christmas trees that you have at home or at school. Decide whether or not they are spruces. Who has a living Christmas tree in his yard? Many people light up an evergreen tree that stands near the house and use this for a Christmas tree.

HEMLOCK. The hemlock tree is an evergreen that looks something like a spruce. The needles are about the same length, but they are arranged regularly on two sides of the twig making the twig appear flat on the top. The under sides of the needles are slightly white.



A SMALL BRANCH FROM A HEMLOCK TREE.

ARBOR VITAE. The arbor vitae is a very common tree in many parts of the country. It is sometimes called the white cedar. This tree does not have needles at all but flat scale-like leaves that overlap each other forming a flat twig.



ARBOR VITAE.



A RED CEDAR.

JUNIPERS. In many places juniper trees are set out in yards. There are two kinds, the common juniper and the red cedar. They look very much alike. You can easily learn to tell them apart. They both have short sharp-pointed clusters of leaves. The red cedar has on some of its branches flat leaves similar to those of the arbor vitae. The red cedar is sometimes called the



A PRETTY GROVE OF EVERGREEN TREES.

pencil cedar because its wood is used almost wholly in the manufacture of lead pencils. (Notebook, page 42.)

PROJECT. Collect twigs and cones of all the evergreen trees you have studied. Mount them on stiff cardboard or in the bottom of a pasteboard box. This may be done as a class project in which everybody helps. When the work is finished it may be put on exhibition in the schoolroom.



A PRETTY WINTER BOUQUET MADE OF PINE CONES AND LEAVES.

BOUQUET. Cones and twigs of evergreen trees make very pretty winter bouquets. They are especially pretty when placed in shallow baskets.

GAME. Play a tree game similar to the one suggested for the pod trees, page 40.

HEALTH. In connection with the study of evergreens and Christmas trees read Mary Gay's "Strange Presents" and "Handy Henrietta," or some other good Christmas health story.

CHAPTER XV

HEALTH DRINKS

DISCUSSION. Repeat rule 8 of the health habits. (See page 15.) Who is trying to keep this rule? Why do you need to drink plenty of water? Water helps your food to digest. It is needed in your blood, in your muscles, and in all other parts of your body. In fact, a large part of your body is made up of water. (Notebook, page 43.)

Milk is a food as well as a drink. It contains all the kinds of foods that children need. It helps to build muscle. It gives you energy and it helps to keep you warm. It is one of the most easily digested foods that you can take. (Notebook, page 43.)

WATER. Where does the water that you drink at school come from? If there are drinking fountains in the building, look at one and name all the parts you can see. What happens when you turn on the water? A valve opens and allows the water to flow out. Notice how high it spouts above the openings.

How should you drink from a fountain? You should never allow your lips to touch the fountain bulb. Put your lips in the water as it flows out.

Where does the water come from? Trace it to the town well or reservoir. Talk about the source of water. It may come from a deep well or from a river. Deep well water is always pure. Where river water is used, it is usually filtered to make it pure and safe.

If you go to school in the country, where do you get your drinking water? If it comes from a well, try to find out whether it is a deep drilled well or a shallow dug well. It is never quite safe to drink water from a shallow well; disease germs are washed into it from the surface of the ground. It may be made safe by covering the wall on the inside about six feet down with cement. It should also have a water-tight cover.

If the water is kept in the schoolroom, it should be in a covered jar or a covered pail. This should be washed out thoroughly and sterilized with boiling water at least once each week.

Each child should have a cup or glass of his own. This should be taken home, thoroughly washed and sterilized once or twice each week.

HARMFUL DRINKS. Tea and coffee are harmful drinks; so is any drink that contains alcohol. There are several reasons why children should not drink tea or coffee. They do not contain any nourishing food. They do not give you any strength. They help to keep your weight down. They are likely to make you nervous and keep you awake at night. They take away your appetite for wholesome foods.

ALCOHOL. Any drink that contains alcohol is worse than either tea or coffee. It affects the brain and nervous system and the person is likely to become cross and nervous. A person who uses alcohol cannot do his work as well as he can without it. The only safe plan is never to begin drinking anything that contains alcohol.

PLAYLET—What Shall We Drink?

A group of three or four children come to the front of the room. They have their hats on as if traveling. A child who is seated near the teacher's desk rises and says, "Well, how are you, Strangers? Can we do anything for you?"

One of the Group: "Yes, we have been walking a long distance and are thirsty. Will you tell us where we can get something to drink?"

Two or three children rise quickly from their seats and begin to talk all at the same time.

First Pupil: "Wait, wait. One at a time, please. Here," motioning to one of the children who is standing, "what do you have to say?"

Pupil: "I have a dairy just around the corner. I can give you good milk to drink."

One of the Group: "Very well, we like milk; but it must be clean if we drink it."

Pupil: "It is perfectly pure and clean. We see to it that the cows are clean, the barn is clean, the milkers are clean, the pails are clean, and the bottles are sterilized in boiling water."

Pupil: "Very well; I think we shall visit your dairy."

Another Pupil: "I have some good lemonade. It is perfectly pure. I serve it in sterilized glasses."

One of the Group: "I like lemonade. It is a good healthful drink. I think I shall have a glass of yours."

Pupil: "I keep a soda fountain; you had better visit me."

One of the Group: "A soda is pretty good once in a while. But if I patronize your soda fountain you must use paper cups in the glasses. Glasses that have been merely rinsed in cold water are not very safe. Who knows how many disease germs they may have in them?"

Pupil: "That is all right. I use the most up-to-date paper-lined glasses. So these are perfectly safe. Better come and have a drink."

Another Pupil: "I can give you some good coffee or tea."

Group in chorus: "No, no, thank you. We never drink tea or coffee. Children who want to grow strong and keep well never touch those drinks."

Pupil: "I have some nice hot cocoa."

One of Group: "It is too warm for cocoa today but some cold day I shall call upon you for a cup of your cocoa."

Pupil: "I have pure, cold water. How will that suit you?"

One of the Group: "Just what I have been waiting for. The others are all right at times, but when I am thirsty I want a drink of water. Please give me a glassful at once."

All the Rest of the Group: "Me, too, me, too."

You may make lines of your own instead of these if your teacher wishes you to do so.

CHAPTER XVI

BIRDS IN WINTER

DISCUSSION. Name some birds that were here during the summer and fall. (Notebook, page 45.)

As you know, most of the birds that are with us during the summer go south for the winter. Some of our birds stay with us all the year around. Other birds spend the summer in the far north and travel southward in the fall. Some of them stay in the United States north of the Ohio River; others go farther south. If you keep your eyes open, you will see a number of birds during the winter months. Keep a list of them. (Notebook, page 45.)

ATTRACTING BIRDS. You may attract birds about your home during the winter months by putting out food for them.

In the third grade you learned how to make a feeding shelf for the birds. If you do not have one, it will pay you to make one at this time. Put it near a window sill, or fasten it to a tree or to a post in a sheltered place in the yard.

On the feeding shelf, put sunflower seeds, hemp seeds, cracked wheat, scraps of meat and bread, and bits of nuts.

Fasten a chunk of beef suet in the crotch of a tree. You should wrap heavy cord around it a number of times. This will keep any large bird from carrying away most of the suet in one mouthful. You may cut up the suet into small bits and place it on the feeding shelf. You should scatter some cracked corn, wheat, and sunflower seeds on the ground under trees and shrubs for the cardinals. Tie an ear of corn to the branch of a tree. Jays will eat this and leave the suet for the chickadees and other small birds.

THE CROW. The crow is an interesting winter bird. While crows are here all the year around, we see more of them during the winter months than at any other time. This is because they live together in great flocks during this season. They go out

together to hunt food and they spend the nights together roosting in groves of trees or in the woods.

OBSERVATION. Watch a flock of crows flying along together. Describe the movements of the wings. Notice how long the wings are. Is the tail long or short? Listen to the calls of the birds as they fly along. Watch them alight in one of their roosting places. Try to determine whether they have leaders who seem to manage the flock. If possible watch the crows feeding. What do they eat? How do they move about upon the ground? If you live near a place where crows nest, it will be interesting to continue your observation during the spring. Where are the nests made? What material is used? Try to decide while you are studying the crow whether it is helpful or harmful to people.

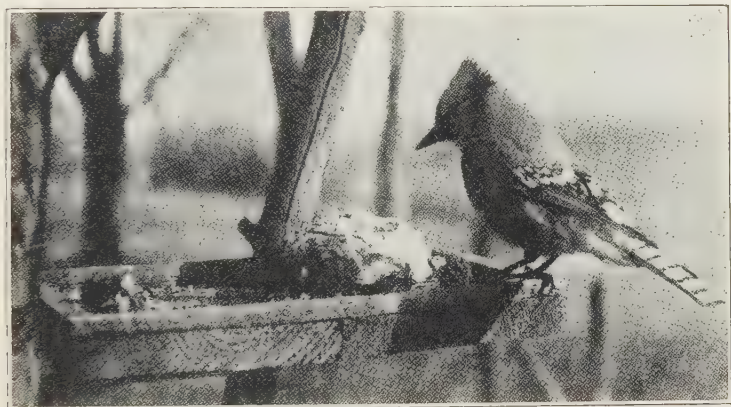
STORY. The crow is one of our largest birds. It is shiny black in color. Its wings are long and strong. It flaps them almost all the time that it flies. The calls of the crow are most interesting. If you listen you will hear "caw, caw, caw." Some of the calls are low and harsh, others are high-pitched. There seem to be leaders of the flock that move ahead and call to the others. Often they seem to answer one another. When a flock is feeding upon the ground, sometimes one crow will be found sitting upon a post or a tree nearby. He is a sentinel and calls out to the flock when any danger approaches.

The food of crows consists of dead animals, live young chickens, and the eggs and young of other birds. Crows also eat seeds of weeds and of poison ivy. Sometimes in the spring they pull up grains of sprouting corn in the fields. They also eat field mice, grubs, cut worms, and other insects. Arrange a list of the foods that crows eat into two groups. (Notebook, page 46.)

Crows build their nests in trees, usually in the topmost branches. The nests are made of sticks, grasses, pieces of bark, and vines. They are built early in the spring, usually the first part of April. The young birds are cared for by both father and mother. They are fed almost wholly upon insects.

BLUE JAY—OBSERVATION. Keep on the lookout for blue jays. Where do you see them? Look closely at one. What colors besides blue does it have? What sounds do the jays make? What do they eat?

STORY. Blue jays are cheery fellows in the winter. In the spring and summer they do some things that we think are good and others that we think are bad. The good thing they do is eating insects that feed upon our garden and field crops. The



A BLUEJAY READY TO HELP HIMSELF FROM A FEEDING SHELF.

bad things they do are robbing the nests of other birds, and eating the eggs and the young nestlings. For this reason, we do not like to have too many jays in the neighborhood.

The jay has two or three different sounds. He calls "Spee, spee" as he flies through the air. Some people think that he says "Jay, jay," instead of "Spee." Listen closely and decide which you think he says. Besides this call note, he sings a pleasing song that you may hear now and then in the spring time. (Notebook, page 46.)

THE CHICKADEE. The chickadee is one of the most delightful of our winter birds. It is a small bird, not quite so large as the English sparrow. It wears a black cap on the top of its head. Its throat also is black. It is a very happy bird. All winter long it sings its merry "Chick-a-dee-dee." Sometimes it sings another song you will like to hear. It sounds something like "Swe-e-t-spring."

The chickadee is one of our very useful birds. It feeds on the eggs of insects that are hidden away in the winter buds of the trees. It also feeds on small insects found in the cracks and crevices of the bark. Watch for it. It is almost certain to come and feed upon your suet.

THE WHITE-BREASTED NUT HATCH. Along with the chickadee, the white-breasted nut hatch will probably come to your yard and help himself to the good things you have on your feeding shelf.

The nut hatch is a little larger than the chickadee. It is blue gray on the back, except the back of the head which is black. The under parts are white. You will find the bird walking down the trunk of a tree head first. Sometimes it walks along the under side of a branch. In fact you may find it in almost any position, on any part of the tree.

The nut hatch is quite as useful to us as the chickadee. All the time it is moving about on the tree trunk and branches, it is looking for small insects and insect eggs. With its sharp bill it takes these out and eats them. Listen for the notes of the nut hatch. They sound something like "quank, quank."

THE CARDINAL. The most beautiful bird that will come to you in the winter is the cardinal. Sometimes it is called the red bird. Wherever these birds are found, they stay all the year around.

Look closely at a cardinal to find other colors than red. Notice the very large bill. Notice also the topknot or crest on the top of the head.

Only the father cardinal is red. The mother bird is reddish brown. Her bill however is red and is as large as that of her mate.

The cardinal feeds mostly upon the ground. It is a seed-eating bird. It eats great numbers of weed seeds. It will also eat shelled corn, sunflower seeds, hemp, and wheat. It is also fond of grape seeds.

The cardinal sings a clear, loud whistle. It whistles now and then during all the winter months. In the spring you will

hear it every day if you listen for it. The mother cardinal sings as well as the male bird. You are likely to hear her sing during the nesting time. See if you can imitate the whistle of the cardinal.

BOB WHITE. I wonder if you know Bob White, our common quail. Quail stay in the same neighborhood all the year



A PAIR OF CARDINALS.

around. They live in the fields and meadows along the roadsides and in the woods. If you live in the country you have certainly seen these interesting birds many times. If you live in town and drive out into the country, keep your eyes open and you may see a flock of bob whites running before you on the road or sailing off at one side over the fence or hedge.

OBSERVATION. What are the colors of the quail? What is the color of the throat? Is the quail larger or smaller than the robin? How does it differ in shape from the robin? Watch it moving about on the ground and decide whether it walks or hops. Watch it as it flies. How does its flight differ from that of other birds? Listen for a whirring sound as it flies. This sound is made by the feathers of the wings.

Listen to hear him whistle his name, "Bob White." Any boy or girl can easily imitate this song. You can learn to do it so well that the bird will answer you.

STORY. Quail are among the most useful birds. Next to the meadow lark they are the greatest bird friends of farmers and gardeners. They eat cut worms, grub worms, chinch bugs, potato beetles, army worms, and many other harmful insects. During the winter they live largely upon weed seeds and upon loose grain that has been left in the fields.



BOB WHITE.

The flesh of the quail is very good to eat. For this reason hunters are allowed in most states to shoot quail for a few days in the late fall. So many are killed during this open season that in many regions they are becoming very scarce. Every state should pass a law protecting these birds for a period of at least five years. Perhaps you can help to have this done.

A STORY—Pinkey

When I was a small girl I lived on a prairie farm. There were many quail in the neighborhood. My brother and I often went out to the part of the farm that was covered with the rolling prairie grass to look for quail's nests. We found them in little hollows in the ground hidden under tufts of dry grass. We tried very hard not to frighten the birds. Sometimes the mother bird would stay on her nest, her bright eyes watching us intently while we stood perfectly still watching her quite as intently. Sometimes as we came near she would flutter off her nest, move along the ground, her wings spread, her feet dragging as if she were unable to walk or to fly. This was the way she had of making us follow her and leave her nest untouched. She need not have feared. Nothing would have tempted us to touch an egg, for we had been told too often that if we handled the eggs of a bird, the mother bird would never return to the nest. So we contented ourselves by looking at the pretty white eggs and counting them. We often found as many as twelve or fifteen in a nest. Once to our great delight we found a nest with twenty-two eggs in it.

One day in the late fall when father came in from the field he called, "Come here, I have something for you." He put his hand down into the large pocket of his coat and drew forth a quail.

"It is badly injured," he said; "perhaps you can cure it."

We found that one wing was badly torn. With the help of our mother, we bound it up. Then we arranged a comfortable home for the quail in a box. To our delight it ate a few grains of wheat that we scattered before it.

I do not know the origin of the name; but we agreed to call our pet Pinkey. In a few days it became tame enough to eat from our hands. In a short time, we allowed it to wander freely about the house and yard. Soon it learned to come to us when we called it by name.

When it was entirely well, father suggested that it might be happier to go and live in the fields with its own kind. Re-

luctantly we took it to the edge of a corn field and left it. Sorrowfully we returned to the house. It was all we could do to keep the tears back. Two hours later, just at dusk, we heard a flutter on the back porch. I opened the door and in flew Pinkey. He seemed as glad to see us as we were to see him.

All winter we enjoyed our pet. Sometimes he would wander away and be gone all day, but he always returned in the evening. One day in early spring I heard a clear "Bob White" below the orchard. Pinkey heard it too. He lifted his head as if listening. Then he flew to the top of the garden gate and whistled "Bob White, Bob White."

I took him down through the orchard. In the field beyond was a flock of quail. He looked at them a moment, then with a flutter of joy, he skipped from my hand and settled down among them. I called, "Pinkey, Pinkey." He did not come. Presently the whole flock sailed across the field and I did not see him again. I never hear the cheery "Bob White" in the spring that I do not recall the happy times we had with our pet quail.

CHAPTER XVII

HEALTH—FIRES AND LEISURE TIME

DISCUSSION. How many houses in your town or district have caught fire within the last year or two? What caused the fire? At what season of the year are fires most prevalent? Make a list of all the different causes of fires that you know. (Notebook, page 49.)

STORY. A large number of fires are due to defective chimneys. Old chimneys become open, and whenever a fire is started in the stove or furnace, the flame sweeps up the chimney and out through a crack or crevice to a rafter or to a joist and the house takes fire.

Many fires are due to carelessness. Fires are started by pouring kerosene over coal that is slightly warm and an explosion takes place. Kerosene may be used to start fires without danger if one knows how to use it. The kindling or cobs should have a small amount of kerosene poured over them outside of the stove or in the stove if it is cold. Kerosene should never be poured into the stove when it is warm or when there is a little fire in it.

Sometimes gasoline causes fires. This is due also to carelessness. Gasoline should never be brought near a flame nor near a hot stove. (Notebook, page 49.)

To prevent fires everybody should be careful. In old houses, the chimneys should be repaired or looked over by a mason every two or three years. This should be done in the fall before fires are started for the winter. In very cold weather on a windy day, care should be taken not to keep the drafts in the stove or furnace wide open and thus allow the flames to rush up the chimney.

Burnt matches should always be thrown into a tin can or some other place where they are not likely to set fire to paper or other things.

BURNS AND THEIR TREATMENT. If you work around a stove at all, you are likely now and then to get burned. When you are burned, the first thing to do is to cover the part to keep the air out. Vaseline, sweet oil, or lard may be used. Cover the burn completely and wrap a clean cloth around it. A paste made by mixing flour or baking soda with water may be used instead of the oil or vaseline.

If a burn blisters, the water should be allowed to drain out. To do this, sterilize a needle by holding it in a flame or placing it in boiling water. Allow it to cool, then pierce the skin and the water will flow out. A little iodine should be placed on the wound made by the needle.

If your clothing or that of a playmate should take fire, smother the flame by wrapping a coat, a rug, or anything that is convenient around the body. If no one is near to help, lie down on a carpet or rug, and roll over and over smothering out the flames. Never run. That is the very worst thing you can do.

LEISURE TIME. What do you do with your leisure time? This means time when you are not in school, not working at home, not studying. What outdoor games do you like to play? Name some games that you play in the evening at home. In all games there are rules. These should be observed by every one. Play fair and keep cheerful. That is the only way to really enjoy a game.

Who read good books in their leisure time? Name some of the books you like best. Sometimes children continue to read when they should be doing some chore about the house, or when it is time to go to bed. That is a good time for you to exercise self-control. Finish the page or the chapter, and then cheerfully lay the book aside until you have some more leisure time. That is one way to show good sportsmanship.

Who go to movies? Movies are an interesting way to spend some leisure time. You should not go too often, however; that is worse than not going at all. Find out from your parents and teacher what movies are good ones. Form the habit of going to that kind only. (Notebook, page 51.)

CHAPTER XVIII

WILD MAMMALS—RABBITS

DISCUSSION. Who of you have seen any wild animals around your home or school this winter? Where did you see them? Write a list of the wild animals that you know. (Note-book, page 52.)

I am going to give you another name for wild animals. We may call them wild mammals. All mammals have four feet. Their bodies are covered with hair, fur, or wool. The mammal mothers provide milk for their young. Name some mammals that are not wild.

All domestic animals, the horse, the cow, the pig, and the sheep are mammals. Once upon a time, thousands and thousands of years ago, they too were wild animals. Men captured them, took them into their homes, fed and cared for them. Little by little they became more and more tame until at last many of them preferred to live with men rather than out in the wild. When the early settlers came to the new world they found many wild animals such as wolves, foxes, bears, and deer. In most places these larger animals have disappeared. But we still have in our woods and fields a number of small mammals that are worth knowing.

RABBITS. The rabbit is one of the most common of the wild mammals. Because of its white tail it is often called the cotton tail rabbit. Where have you seen rabbits? What were they doing? If you live in the country or in a small town, perhaps you can trap a rabbit and bring it to school for study. Some of you may have hares or pet rabbits at home that you may bring to school. A comfortable home may be made for them by nailing slats on the top of a wooden box and putting a little straw or hay in the bottom.

OBSERVATION. Look at the rabbit or hare. Each tell one thing that you see. Study the body covering of hair. Notice how thick and coarse it is and how the hairs overlap each other.

On what part of the body are the hairs longest? Where are they shortest? Notice carefully the ears and describe them. Observe also the eyes, the nose, and the mouth. Watch the movements of each.

FOOD. Feed the rabbit bits of carrot, lettuce, or other green vegetables. You may also feed them green clover if you can find it at this time of the year or dry alfalfa hay. Watch the jaws as the rabbit chews its food. Notice the sharp teeth.



A PET RABBIT. THIS IS A YOUNG BELGIAN HARE.

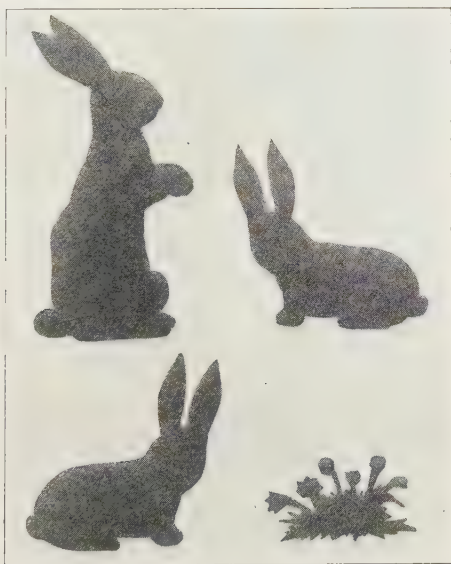
Study the legs and feet. How do the front feet differ from the hind ones? Describe the tail.

Out of doors, rabbits feed upon grass, clover, and other green plants. In the winter when they cannot find green leaves of any kind, they often peel the bark from young trees and eat this. In this way they are quite destructive to young apple trees.

STORY. Rabbits and hares are near relatives. They look very much alike, although they differ in color. The chief difference between them is that the baby hares, when they are born,

are covered with hair, and have their eyes open. Baby rabbits are born without any hair at all upon their bodies and do not have their eyes open until they are a week or more old. The cotton tail is a rabbit, but the Jack rabbit that lives in the western part of the United States is really a hare. Some rabbits have been brought into this country from Europe and are kept either as pets or raised for food. The Belgian hare is one of these. However, it is really a rabbit instead of a hare.

ENEMIES OF RABBITS. Rabbits have many enemies. Young rabbits are often caught by dogs and cats. Hawks and owls



RABBITS CUT OUT OF PAPER FOR THE NOTE BOOK.

both catch rabbits and eat them. Some other enemies are the fox, the mink, and the weasel. How do rabbits defend themselves against their enemies? Perhaps you have seen a rabbit chased by a dog. You may have noticed how it dodges and then runs in a zig zag fashion to keep out of the way of the dog. When chased by an enemy, a rabbit always tries to seek a place of shelter under which it may hide, such as a brush pile, a corn crib, or a hollow log. Another interesting way in which rabbits

are protected is by means of their color. They resemble closely dead grass or brown soil. Often they crouch down, keeping perfectly quiet and looking so much like a clod or a clump of grass that their enemies pass by without seeing them.

USES. You probably know that rabbits furnish food for people. The flesh is delicious stewed, baked, or fried. For this reason, rabbits are hunted during the winter season. Perhaps you have gone hunting with a dog and a stick. You may have traced the rabbit by following its tracks in the snow. What kind of tracks does it make? Draw the tracks. (Notebook, page 54.)

YOUNG RABBITS. You may find in the early spring a nest of young rabbits. The mother rabbit makes a little hollow in the ground, usually in a meadow or pasture, sometimes in yards or gardens. Then she places dry grass in the nest. She lines it with hairs that she takes from her own body. This makes a soft warm bed for the little rabbits. At first the young rabbits live on their mother's milk. When they are from six to eight weeks old, they begin to nibble grass and clover and to take care of themselves.

Young rabbits are often called bunnies. What stories about rabbits or bunnies have you read? Tell one to the class.

CHAPTER XIX

SQUIRRELS

OBSERVATION. Study any squirrels that you have in your neighborhood. What color are they? Do you think they are all the same kind? Watch to see what they do. How does a squirrel climb a tree? Watch it jump from one branch to another. What different movements does it make with its tail? How does it hold its tail when it is sitting still? When it is running over the ground?

FOOD. What do squirrels eat? Watch one as it holds a nut or other food in its front feet while it is eating. Squirrels like the seeds of pears and apples. Sometimes they destroy much of the fruit in order to get the seeds. Squirrels will often eat the suet that you put up in the trees for the birds. Watch squirrels burying nuts in the ground. You can easily tame squirrels so they will take nuts out of your hand. Some squirrels rob birds' nests. They eat the eggs or the young birds. The red squirrel is the worst enemy of birds. Fox squirrels also rob birds' nests.

NESTS. Watch a squirrel making its nest in the spring. Most squirrels like to build their nests in hollow trees. The fox squirrel builds a huge nest out of dry leaves and sticks in the topmost branches of trees. In these nests they rear their young.

STORY. There are several different kinds of squirrels. If you live in the eastern part of the United States you will probably see more gray squirrels than any other kind. You will also see the red squirrel. In the middle western part the most common is the fox squirrel. In the far west the western gray squirrel and a small red squirrel are abundant.

The back of the gray squirrel is a pretty dark gray in color. The under parts are white or yellowish brown.

The fox squirrel is about the same size as the gray squirrel. Its back is a rusty brown. The under parts are a bright tan. The feet and legs are the color of the under parts.



(Courtesy of the Nature Magazine)

A GRAY SQUIRREL FEEDING UPON A NUT.

The red squirrel is a reddish brown color above. The under parts are whitish. It is much smaller than either the gray or fox squirrel.

FLYING SQUIRRELS. The flying squirrel is a pretty little creature about five inches long. Its fur is fine and soft. It is a light fawn color with a border of white around the sides. This little squirrel does not really fly. That is, it does not fly with wings. The skin between the front and hind legs on each side is loose like a flap or fold. When the squirrel jumps it spreads out this flap and sails downward from one branch of a tree to another. Sometimes it flies from the tree down to the ground. It cannot fly upward.

The flying squirrel is easily tamed. It seems to like to make its nest of leaves and grass very near the homes of people. I knew a pair that raised their young on a ledge above a living room window.

During the day these little squirrels roll up into balls and sleep. Early in the evening they awaken and come out to feed. Often they may be seen skipping and playing upon the ground.

CHAPTER XX

SMALL MAMMALS

DISCUSSION. Besides rabbits and squirrels, there are a number of small mammals that you see now and then. I wonder whether you have ever seen a mole or a ground squirrel, a pocket gopher or a chipmunk? One reason that you do not see these little animals often is that they make their homes in the ground or hide away under brush piles, logs, and stones. They spend most of the daylight hours in their homes and at night they come out to search for food.



JIM, THE PET GOPHER IN HIS CAGE. IN ONE END IS HIS GLASS JAR TUNNEL, IN THE OTHER HIS WARM NEST.

THE POCKET GOPHER. The pocket gopher rarely shows himself above the ground during the daylight; but as soon as the darkness begins to settle down, he comes out of his burrow and sneaks around looking for something to eat. He has a pretty soft coat of gray fur. Sometimes there is a little tint of brown on the front part of the body.

The gopher has short legs and very small eyes. His tail is

about as large around as your lead pencil and three inches long. His front teeth are long and sharp so that he can gnaw very well. His upper jaw extends quite a little over the lower one. At each side of the face, he has a fur lined pouch or pocket. In these pockets he carries the food he has gathered from fields and gardens to his burrow in the ground. Because of these pockets he gets his name pocket gopher.

This little animal is greatly disliked by farmers and gardeners. They have good reason to dislike him. He digs up the grain and wheat from the fields where they are planted. He takes young vegetables from the gardens and eats the roots. He is a greedy creature and can destroy great quantities of grain and vegetables.

His front feet are like shovels. He uses these to make his burrow and to dig up roots and seeds out of the ground.

STORY—Jim, a Pet Gopher

Jim was a half grown gopher when he was caught in a trap that a farmer had set for him and his mates. The farmer put him into a box with slats nailed over the top and brought him to school for the children to observe.

We soon found that it would not do to leave the gopher, which we named Jim, in a wooden box. In less than an hour after he was brought in, he had gnawed a hole at the edge of one of the slats and was climbing out when we discovered him.

We found an old aquarium and placed over it a cover made of strong wire. We put about six inches of soil in the bottom of the aquarium, then dropped Jim into it. The first thing that he did was to explore every part of his new home. He dug into the soil, throwing the dirt back between his hind legs. He sniffed around in every corner, running rapidly from one place to another. I threw a handful of corn into the cage. He hurried over to it and began to put it into his pockets. He used his front feet to push the grains into the pockets. Soon the pockets stood out like great bunches on each side of his face. When he could not get another grain inside, he ran to a farther corner

of the cage, dug a little hollow in the soil and dumped the grain into it. He used his feet to push the grain out of the pockets.

The front feet were really very wonderful. He used them much as you would your hands. With them he brushed the dust from his body and smoothed his coat of fur. With them he cleaned his face and his small ears. He used the long claws on the feet to scrape his teeth. He held his food with the claws while he nibbled off one bite after another.

We put dry grass and some pieces of newspaper into the cage. Jim tore the paper into shreds and then in one corner he made himself a cozy little nest. In this he curled himself up like a ball, his head hidden on the under side of his body.

We placed a pint fruit jar on its side in one end of the cage. Whenever he was frightened, he always ran into this glass tunnel. He went in head first, but in the most agile manner he turned around in less than a second and stuck his head out of the opening.

In a short time, when anyone approached his cage, he expected to be fed. We tried him on all sorts of foods. He was very fond of lettuce and carrots. He also ate cabbage, celery, beets, and potatoes. He liked both wheat and corn. He was very fond of the green leaves of dandelion and plantain, and of the roots of blue grass. The fact is that while he liked some things better than others, he ate almost everything that was offered him. He was a cleanly little chap. He always brushed up his head and face and cleaned his teeth before he began to eat.

Jim seemed quite happy in his cage. When winter came, he made his nest deeper with grass and paper. In this he cuddled down and slept most of the time. Probably if he had been out of doors in his earth tunnel he would have slept during the entire winter. On the whole we found him a most interesting little animal.

THE MOLE. The mole lives always in its tunnel in the ground. The body is very flat and is covered with pretty fine gray fur. The front feet are short and shaped like wide shovels. Its nose or snout is long and ends in a hard point like a drill.

The toes and the front feet are the tools with which the mole digs its tunnels. It is a very rapid worker. It can tunnel a foot or more in three or four minutes.

No doubt you have seen the tunnel-tracks of moles. They extend half an inch or more above the surface of the soil. In making these tunnels, the mole cuts off the roots of grass on the lawn, and plants in the garden. If it were not for this bad habit, we should consider the mole a real friend. It does not eat the roots, instead it eats grubs, beetles and other insects in the soil.

Besides the surface tunnels, the mole has a wide burrow deep in the ground in which it stays during the winter and where it raises its young in the spring.

The fur of the mole is used to make collars, and to trim coats and dresses. Even whole coats are sometimes made of moleskin. The animal is so small that it takes a large number to make even a collar. For this reason the fur is very expensive.

GROUND SQUIRREL. Who of you have ever seen the little brown striped ground squirrel? It is sometimes called a gopher, but it is not a true gopher. As you may suspect, from its name, the ground squirrel makes its home in burrows in the ground. The burrow usually descends almost straight downward for two or three feet and then runs out side ways a number of feet.

FOOD. The ground squirrel feeds upon grains, berries, and leaves of plants. Sometimes it is quite destructive to corn crops, because it digs up the grains when they are planted and eats them or carries them off to its burrow. It also eats grasshoppers, crickets, and cut worms. Sometimes it gathers great numbers of half ripe strawberries, places them in little piles, eats a few and leaves the rest to spoil. Like the pocket gopher, the ground squirrel has pockets in its cheeks. In these it carries food to store in its burrow.

Have you ever seen a ground squirrel when it is watching an enemy. It stands up on its hind legs very stiff and remains perfectly still, so still that it looks like a small stick or a bit of brown grass. It often remains in this position a number of minutes until its enemy disappears or comes so near that it is

forced to run. If you keep your eyes open next spring and summer, you are almost certain to find these little squirrels sitting up watching you as you come near.

WOODCHUCK, OR GROUND HOG. You have all heard I am sure the story of ground-hog day. The story goes like this: On the second day of February, the ground hog comes out of his burrow. If the sun is shining and he sees his shadow, he hurries back into his home and stays there six weeks longer which means



A SAUCY LITTLE CHIPMUNK.

that we shall have six weeks more of winter. The story is an old myth that no one really believes.

The right name of the ground hog is woodchuck. This animal is quite common in the eastern part of the United States; it is frequently found in the middle western part. It has a flat body nearly two feet long. Its fur is coarse and brownish gray in color. Its short legs are thick and end in very strong claws. With these, it digs a burrow in the ground where it lives most

of the time. Like the gopher it feeds mostly at night. It eats clover, grass, vegetables, and apples which it finds on the ground. It is also very fond of young chickens so that in some regions it visits the chicken coops during the night and carries off some of the young.

This little animal does not store up food for the winter, instead it eats and eats and eats in the fall until it is very fat, then it cuddles down in a grass lined burrow and sleeps during all of the cold weather. When spring comes it crawls out very thin and ready for a good meal.

CHIPMUNK. In the eastern part of the United States there is another little animal that looks much like the striped ground squirrel. You will find it chasing around fences, piles of rocks, and logs. It is a pretty little creature, dark reddish brown in color with stripes of light tan and black along the sides and back. It eats grain, small nuts, and berries. While it hides among rocks, under fences and hollow logs it also makes a burrow in the ground where it stores food and hides during the winter. It does not sleep or hibernate but on warm days comes out of its burrow into the sunshine. (Notebook, page 55.)

CHAPTER XXI

FUR BEARING ANIMALS

DISCUSSION. The fur of many wild animals is used for coats, collars, caps, and to trim dresses. Some of the animals you have already studied furnish fur for these purposes. This is true of rabbits, squirrels, and moles. Besides these, there are a number of fur bearing animals that you are not so likely to see, although you may see their fur in collars, or in coats. The most common of these are the mink, the weasel, the beaver, the skunk, and the fox. Write a list of animals that provide fur for us. (Notebook, page 56.)

OBSERVATION. Bring to school small pieces of fur that you may find at home. What different colors do they have? Notice how thick the fur is. How do the different kinds differ as to the length of the hairs?

Study pictures of these animals. You can get good colored pictures of most of them. (See page 57.)

Perhaps you may go to a museum where there are stuffed specimens of these animals that you may observe. If you have a Zoo in a park you may study some of the live animals there.

THE MINK. The mink is a very long, slender animal. It is about as big around as a man's wrist, but it is fully a foot and a half long. It feeds upon birds, field mice, and occasionally upon young chickens. The fur of the mink is fine and of a pretty brown color. It is one of the most expensive kinds of fur.

THE WEASEL. The weasel is much smaller than the mink. It is not much bigger around than a large snake; but it is very long. It is a fierce little fighter. It kills ducks, geese, rabbits, and other animals much larger than itself. Its fur is brown in the summer but changes to a pure white during the winter.

THE SKUNK. The skunk is much larger than the mink or the weasel. It has the same feeding habits. That is, it lives upon the flesh of birds and animals. In the country it often makes a raid upon chickens during the night. In color it is

black with white streaks. The hair is rather long and coarse, but it is coming more and more into use for collars and coats. Usually the white parts are dyed black before it is used.

The skunk has another name. It is often called polecat. It throws from some glands that are in the back part of its body, a very ill-smelling fluid. This is its way of protecting itself from its enemies. People are beginning to raise skunks for



(Courtesy of the Nature Magazine)

A SKUNK EATING HIS DINNER.

their fur. When this is the case, the glands which secrete this ill-smelling fluid are removed from the body when the animals are young. They can then be cared for without any annoyance.

BEAVER. Beaver fur is very valuable. It is a pretty shade of brownish gray. It is very thick and fine. When the animal is alive this fine fur is covered on the outside by a layer of long coarse hairs. These are removed when the fur is put on the market.

No doubt you have read some interesting stories about beavers. A number of them live and work together in colonies. They make their homes near a pond, a lake, or a stream. With their very strong, sharp teeth they cut down trees and use these with the small branches and twigs to build their home over a portion of the water. The logs are plastered together with mud. Beavers use their front feet to put in the plaster. They do not use their tails for this purpose as people used to think. The tail is used to guide the beaver through the water when it is swimming.

Beavers cut down trees to make dams as well as for their home. They build the dams in front of their home so they will always have deep water under it. The only entrance to the home is on the underside by way of the water. Beavers work at night and sleep during the day. They usually start their work a little before sunset.

Beavers eat the bark of trees. In the fall they store great masses of twigs and small branches in the water back of the dam. These supply them with food during the winter months. They are especially fond of box elder, poplar, elm, willow, and birch.

FOXES. The fur of several different kinds of foxes is much used. Who of you has ever seen a fox? Describe it. What kind of ears has it? What kind of tail? Describe the nose and ears.

The fur of the silver fox is very pretty and is used more than that of any other. It costs a great deal of money. In some places people are starting what they call fox farms. Here foxes are raised and kept in captivity. They are fed and carefully looked after. When they are old enough they are killed and their fur is sold.

GAME. You may play an animal game that you will like. One child stands in front of the class and says: "I am thinking of a wild mammal." "It has a bushy tail.—It lives in trees—It eats nuts—etc." After each sentence he pauses. Every child who knows at the end of the first sentence stands up. They

remain standing. If some are still seated they stand at the second or third sentence. The name is written upon the board by one of the children.

The first child who stood now describes another animal. This is continued until most of the animals are reviewed.

CHAPTER XXII

MICE AND RATS

DISCUSSION. Everyone has seen mice that come into our homes. In what different places have you seen them? What do they do that you do not like? Name some things that they eat. Where do they make their homes? Have you ever found the nest of a mouse? Out of what was it made?

If you can capture a mouse, it will be worth while to put it into a small cage and study it. (Notebook, page 58.)

STORY. A mouse is an interesting little animal, even though it is a bad pest. It has a cover of soft gray fur. It has a sharp nose, small ears, and tiny bright eye. The tail is long and slender. Its teeth are very sharp and strong. A mouse can gnaw through wood and heavy pasteboard. It can crawl through a very small opening.

Mice like to eat bread, cake, flour, starch, meat, and many other kinds of food that we keep in our pantries and cupboards. They like cheese better than almost any other kind of food.

Mice make their nests in warm cozy corners. They tear up paper or cloth into scraps and make a soft round nest. I knew of a mouse once that carried scraps of paper and cloth into a fruit jar that was lying on a shelf in a basement. When the jar was almost full, it made a little tunnel through the scraps and hollowed out a round nest. Before long there were five baby mice. They had no hair but were covered with pink skin. They grew very fast. In less than three weeks they were almost as large as their mother and were ready to steal about the house helping themselves to whatever food they could find.

The common mouse that we call the house mouse is a native of a far away land called Asia. It has found its way into almost all parts of the world.

Besides the house mouse there are many other kinds. One is very common in our fields and meadows. It is called the meadow mouse. It eats the seeds of wild plants and also of

grain that is left in the fields. It sometimes feeds on the roots of young trees and shrubs. Now and then these mice come into barns and destroy much grain.

Most mice sleep or hibernate during the cold winter months. (Notebook, page 58.)

RATS. Who of you has ever seen a rat? Describe it. What do rats eat? What other things do they do that we dislike?

Besides eating grains, chickens, and other poultry, rats destroy property by burrowing under buildings and covering food such as vegetables stored in basements with dirt and filth. Rats also are harmful because they carry germs of certain diseases from one place to another.

The common brown rat is not a native of America. It has been a pest in Europe and Asia for hundreds of years. It was brought to this country by the early settlers. It came over in the ships hidden away in the lower parts. When the ships were anchored, near the shores, the rats came out on the land and remained here. (Notebook, page 58.)

GETTING RID OF MICE AND RATS. Since mice and rats are such destructive creatures, we should try very hard to get rid of them. One of the best things to do is to set traps for them. There are a number of good traps. For mice the small spring traps are the best. They should be baited with either cheese or bacon. There are several different kinds of rat traps any of which are good. Rats are often killed by placing poison where they are likely to get it. People should be very careful in using poison not to place it where cats, dogs, and other animals about the home may get it. It should not be left out during the day. Another way to help get rid of rats is to destroy brush piles, piles of old cans and other rubbish under which they may burrow and make their homes. Rats may be kept out of buildings by using cement floors and foundations. If all the people of a community would work together they could get rid of all the rats. Perhaps you can help to start a rat campaign.

CHAPTER XXIII

TEETH

DIFFERENT KINDS OF TEETH. You remember when you were between six and seven years old that your front teeth became loose and finally dropped out. Later some of the other teeth loosened and came out. These were your temporary teeth.

Children begin to get their temporary teeth when they are about six months old. Some children get them a little younger. All together, there are twenty of these teeth, ten in each jaw. A child has all of his temporary teeth when he is about two years old. (Notebook, page 60.)

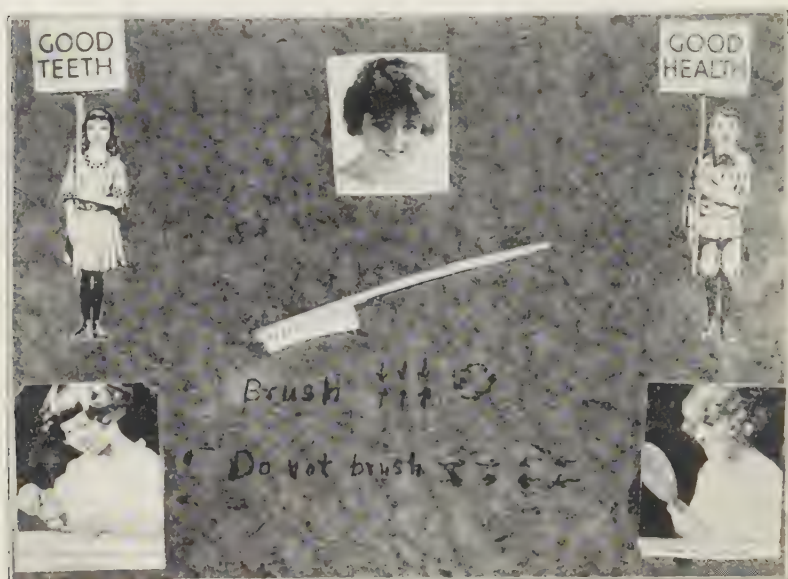
PERMANENT TEETH. The teeth you have now are called your permanent teeth. They form in small hollows in the bone directly beneath the roots of the temporary teeth. As they grow, they move upward pressing against the roots of the temporary teeth. This causes the temporary teeth to loosen. When they drop out, the permanent teeth come through the gums to take their places.

When a child is about six years old, he cuts in his gum back of the last temporary tooth in each half jaw his first permanent grinding tooth. A child has all of his permanent teeth when he is about twelve years old except his wisdom teeth. These come in any time after he is sixteen years of age. When he gets all of his permanent teeth he has sixteen in each jaw. Notebook, page 60.)

CARE OF THE TEETH. How often do you brush your teeth? Why should you brush them? Look at your teeth in a mirror to find the wrinkles and crevices in which food may collect and remain. Brushing helps to remove these bits of food. If the food is left in the crevices, it ferments and decays. This may cause the teeth to decay and ache. Decaying teeth cause bad breath. Besides this, they form a lodging place for germs of many diseases. These germs may enter the stomach with the food and cause ill health. Children with poor teeth are not

likely to be as healthy as those whose teeth are well cared for. It is quite as important to care for the temporary teeth as it is to care for the permanent ones.

WHEN TO BRUSH TEETH. The teeth should be brushed regularly every morning and night. It is a good thing to brush them after each meal when this is possible. A good tooth paste may be used once a day. This helps to remove the food that



GOOD TEETH MEAN GOOD HEALTH. A POSTER MADE BY FOURTH-GRADE PUPILS.

has collected in the cracks and crevices. Your tooth brush should not be too large and the bristles should be hard enough to take out bits of food from between the teeth.

HOW TO BRUSH THE TEETH. The teeth should be brushed from the gums toward the cutting edges. Then the brush should be moved sidewise and round and round in a scrubbing motion. When you have finished brushing the teeth, rinse the mouth well with warm water. A little salt in the water helps to cleanse the mouth.

THE DENTIST. It is a good thing to visit a dentist two or three times a year. The chief work of a dentist is to help care

for the teeth so they will not decay and cause toothache. A hard substance called tartar often collects on the teeth. A dentist removes this and prevents a disease of the gum which may start under this. He also finds small cavities that are just starting. By filling these cavities further decay is prevented.

SPRING STUDIES

CHAPTER XXIV

PLANTS

DISCUSSION. Who of you are planning to have a garden of your own this year? How large is it to be? If you do not know, ask your parents tonight whether you may have a small plot for your garden. You do not need a plot more than five feet wide and eight feet long.

What do you wish to grow in your garden? You will probably want some vegetables and also some flowering plants. Radishes, lettuce, spinach, beans, onions, and potatoes are good kinds of vegetables for fourth grade children to raise. Write in your notebook the names of the vegetables you wish to grow. (Notebook, page 62.)

Last fall you studied some flowers. What were they? (See page 2.) How would you like to grow some of those this year? Here are some others that you may like: larkspur, petunia, nasturtium, verbena, coxcomb. (Notebook, page 62.)

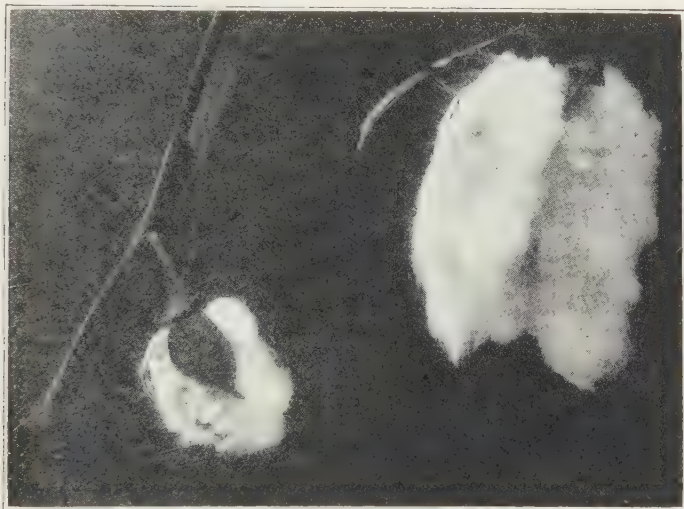
All of the vegetables we have named except the beans may be planted in your garden out of doors just as soon as the soil is dry enough to work. The beans must wait until all danger of frost is past. Of the flowers, the nasturtium may be planted early. About the time you plant beans. The rest of the flowering plants should not be planted until danger of frost is past.

SEED STUDY. You will be interested to know the seeds of the different plants you are to raise in your garden. For your seed study, make a small paper tray. Take a piece of paper four or five inches square. Turn up the edge one-half inch all the way around. Cut the corners so they will fit together and paste them. You will now have a tray ready for your seeds.

Place a few seeds of each kind of vegetable in your tray. Look closely at each. Notice the size, the shape, and the color. How do the different kinds differ from each other? Study

the seeds of the flowering plants in the same way. Draw the form of each seed. (Notebook, page 63.)

COTTON. I wonder whether you have ever seen cotton plants growing? If you live in the south you have seen fields and fields of this pretty plant. If you live in the eastern or middle western parts of the United States you probably have never seen cotton plants. You have however, seen cotton cloth.



COTTON BOLLS. THE ONE TO THE LEFT IS JUST BEGINNING TO OPEN.
THE ONE TO THE RIGHT IS READY TO PICK.

Name some clothing that is made of cotton cloth. Who of the girls in the class have on cotton dresses or aprons? Who of the boys have cotton waists or shirts? Perhaps some of you have cotton handkerchiefs or cotton stockings. In your home there are a number of things made out of cotton. Think of sheets, pillow cases, towels, and curtains. (Notebook, page 64.)

SOMETHING TO DO. Collect scraps of different kinds of cotton cloth. Cut them neatly into pieces about one inch square. Paste them in your notebook. Write a sentence that tells what these pieces represent.

COTTON BOLLS. The part of a cotton plant that is used to make cloth is called the boll. It is the fruit of the plant. It

has the seeds in it. These are attached to soft white threads called cotton fiber. If you have a boll examine it carefully for a few minutes. Name some of the things that you find.

The covering of the boll was the outer part of the cotton flower. Inside are the clusters of fibers with the seeds fastened to them. When the boll is ripe, the cover splits into four parts. Then the white cotton begins to peep out. Little by little, the fibers come out until they hang down in thick white clusters.

Take out some of the fibers in which you can feel a seed. Separate them and straighten them out as you see them in the picture on this page. (Notebook, page 64.)



A COTTON SEED COVERED WITH FIBERS. BELOW ARE SEEDS FROM WHICH THE FIBERS HAVE BEEN REMOVED.



TWO COTTON PLANTS WITH THE FIRST PAIR OF LEAVES

Remove all the fibers from a seed. Describe the seed. Make drawings of the boll and all its parts. (Notebook, page 64.)

PROJECT. Plant some cotton seeds about the first of April in a small flower pot. Put two or three seeds in each pot. Use garden soil with a little sand mixed with it. Cover the seeds about one-half inch deep. Water and keep in a warm place. Watch for the appearance of the little plants. Notice the shape of the first pair of leaves.

When the second pair of leaves appear, notice how they differ from the first ones.

When all danger of frost is past, remove your cotton plants from the pots and set them out in your garden. In the summer, they will blossom and bear the bolls.



A COTTON PLANT READY TO TRANS-
PLANT TO THE GARDEN

If you live in the south, you may plant your cotton seeds out of doors in your garden instead of in pots. When the bolls ripen in the fall save some of the seeds for next year's planting.

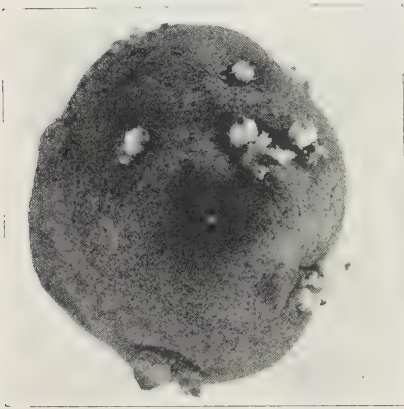
CHAPTER XXV

GROWING PLANTS FROM UNDERGROUND PARTS

DISCUSSION. When you grow radishes or lettuce or cotton, you use seeds to start the new plants. Name other plants that you start with seeds.

Some plants may be started in other ways than by the use of seeds. Who can think of any?

POTATOES. You have all eaten the common white potatoes. Name different ways in which they are served on the table. In what way do you like them best? Potatoes are good food.



POTATO TUBER SHOWING THE GROWING
BUDS.

They contain a large amount of starch. It is not wise to eat too many potatoes. One should always eat other kinds of vegetables with them. Baked potatoes are probably more healthful than potatoes cooked in any other way. Fried potatoes are the least healthful. They are hard to digest and should not be eaten often, especially if they are greasy. Potato soup is a good wholesome food for children. I wonder whether you

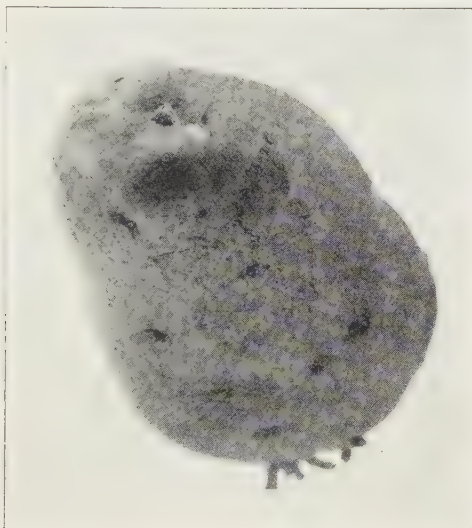
know how new potato plants are started. (Notebook, page 66.)

OBSERVATION. Bring a potato to school for study. What is the color of the skin or outside part? Look carefully at it. What do you call the small, round bodies that are scattered all over it.

We usually call them eyes. The eyes are really buds, just like buds on a tree. Have any of the buds on your potato begun to grow? If you look closely, you will see that the buds are more numerous on one end of the potato than on the other end. We call this the bud-end of the potato.

Each one hold your potato with the bud-end upward. Look at the opposite end. What do you find?

You may find a small dry stem or you may find only the scar showing where the stem was fastened. This end of the potato is called the stem-end. Since the eyes of a potato are buds that grow into stems, with leaves on them, the potato is nothing but a thick stem for buds grow only upon stems.



A POTATO TUBER SHOWING THE STEM END.

Because it grows in the ground, we call it an underground stem. There are several kinds of underground stems. This one is a tuber.

When we raise potatoes, we plant the tubers instead of seeds to grow new plants. We do not plant the whole tuber. Instead, we cut it into thick chunky pieces and plant these. We leave at least two good buds on each piece. (Notebook, page 66.)

PROJECT. You will be interested to see just how the tuber with its buds starts a new plant. Fill a large flower pot or a box or a tin pail almost full of good soil. If you use a box or pail, be sure to see that there are holes in the bottom so the water may drain out. Cut a potato into pieces. See to it that

there are two buds on each piece. Plant two pieces in the flower pot. Plant them about an inch and a half deep. Water them and keep the pot in the coolest part of the room. When the stem and small leaves appear above the soil, dig up one of the plants to find out how the growth began. Make a drawing

to show where the roots grow out of the stem. (Notebook, page 67.)



A POTATO PLANT GROWN IN THE SCHOOL-ROOM.

Care for the other plant until the very last week of the term. Then dig it up carefully to see what has taken place. You may find the short stems with the little tubers forming at the ends. This project may be carried on out of doors instead of in a flower pot if you have a small plot in the corner of the school yard.

STORY. You may be interested to know that the potato is a native of a land far south of the United States called South America.

People who came across the Atlantic Ocean years ago found the potato and took some of the tubers back to their homes in Europe. They planted them there and soon learned to use the tubers for

food. They grew so well in Ireland that they were given the name Irish potatoes. The best name for them, however, is white potato.

GARDENS. Perhaps you have decided to plant potatoes in

your own garden. You may plant them as early as you can work the soil. If you plant more than one row, make the rows about two and one-half or three feet apart. Plant the pieces twelve or fifteen inches apart in the rows. Put one piece in each place. Plant them four or five inches deep. Hoe or rake the ground once before the plants come up. All through the growing season hoe them frequently to keep the soil fine and loose. Do not allow any weeds to grow. When the stems begin to die dig your potatoes. Measure to see how many you raised.

OTHER UNDERGROUND STEMS. Think of some other garden plants that are grown from underground parts instead of seeds.

When you plant a tulip or a narcissus or a daffodil, you use an underground stem called a bulb.

ONION. Onions may be grown from seeds or from small bulbs called sets. If you raise onions in your garden you may plant a row of seeds and another row of sets. Watch to see which produce onions first. (Notebook, page 67.)

CHAPTER XXVI

BIRDS IN SPRING

DISCUSSION. Name the birds you studied during the winter. Which of them have you seen this spring? What new birds have you seen? Keep on the lookout for birds about your home and school. Keep a list of them. (Notebook, page 68.)

MEADOW LARK. One of the birds that you will see quite early in the spring is the meadow lark. Watch for the bird in fields and pastures. Now and then in the early spring a meadow lark may come near your home, settle in the topmost branches of a tree and sing its wonderful song.

OBSERVATION. If you find a meadow lark, try to see its colors. What is the color of the back? Of the breast, and other under parts? Notice the white feathers in the tail as the bird flies. Notice also the black V-shaped spot on the bright yellow breast.

Listen to the song of the meadow lark until you will know it wherever you hear it. It is one of the prettiest of our bird songs.

NEST. Have you ever found the nest of a meadow lark? Where was it? Out of what was it made?

STORY. The meadow lark is one of the very best friends of the farmer. It lives most of the time in the fields. It eats some of the worst insect pests such as army worms, chinch bugs, grub worms, and cut worms.

The nest of the meadow lark is built upon the ground, usually in a little hollow under a tuft of dry grass. It is made out of grasses. Sometimes the bird makes an arched pathway under the dry grass leading to the nest. Meadow larks lay from four to six eggs. The eggs are white, speckled with brown.

Meadow larks should be carefully protected because of the good they do and because of their cheery songs. (Notebook, page 68.)

ROSE-BREASTED GROSBEAK. The rose-breasted grosbeak is another bird that you will like to know. It comes from the south about the first week in May. The male, or father bird, is black and white on the back. It has a rose-red breast. If you could get a peep under the wings, you would find that they are lined with a bright rose-red. The mother bird is brown and tan. Her colors are much like those of the common sparrow.



A PAIR OF ROSEBREASTED GROSBEAKS AND THEIR NEST.

If you can get close enough to the grosbeaks notice the very large bills.

The grosbeak has a very pretty song. At first you may think it sounds like a robin's song. When you listen awhile you find that it is quite different. The female sings as well as the male. I have heard her singing her low sweet song while she was sitting upon her nest.

The nest is built out of twigs, small roots, and bits of weed stems. It is usually placed in the crotch of a tree eight or ten feet from the ground.

Grosbeaks eat seeds of weeds and of other plants. They are also very fond of the common potato bug or beetle. You see then that they are very useful birds to have about our fields and gardens. (Notebook, page 68.)

THE BALTIMORE ORIOLE. The Baltimore oriole is one of our brightly colored birds. It is reddish-orange on the breast,

on the sides, and on the hinder part of the back. The rest of it is black. The mother bird is dull yellow and brown instead of orange and black.

The oriole comes to us in May. It has a clear ringing whistle that sounds like "Pee-ter, Pee-ter, Pee-ter."

The nest of the oriole is a wonderful piece of workmanship. It is made by the mother bird. She weaves it out of strings, or hair, or strips of bark, and tough grasses. It is a bag four or five inches deep and about three inches wide across the top. It usually hangs far out on the end of a branch from twenty to thirty feet from the ground.



THE NEST OF A BALTIMORE ORIOLE. THIS IS MADE OUT OF STRINGS.

Orioles have a number of names. They are called fire birds, hangnests and golden robins. (Notebook, page 70.)

CARING FOR BIRDS. You can do a number of things to help protect and care for birds during the spring and summer. All birds must have water in order to live and be comfortable. They need water to drink and they need water in which to bathe. You may put out pans of water in your yard at home,

and at school. Granite pans three or four inches deep serve very well for this purpose. Place them in the shade of trees or of shrubs. It is a little safer for the birds if you set the pan on a stump or box a foot or more above the ground. In this way cats are not so likely to catch the birds when they come from the bath.

Put out nesting materials for the birds. Cut some strings about two feet long and hang them on the lower branches of trees or on shrubs. Orioles will come for them to weave into their nests. Robins and bluebirds may also help themselves to the strings. Small twigs and handfuls of dry grass may be placed on the ground near shrubs for grosbeaks and other birds.

AUDUBON SOCIETIES. I wonder if you have ever heard of Audubon Societies? Perhaps there is one in your neighborhood. The society is named for John James Audubon who was a great lover of birds and of all nature. He lived over a hundred years ago. He cared more for birds than for anything else. He took long tramps through the woods just to study them. He found out more about their ways and habits than anyone else who had lived up to that time. He made beautiful drawings of them and put those into a large book which is called "Birds of America." Long after his death when men and women began to study birds and care for them, they formed a society and called it the Audubon Society. Its purpose is to encourage men and women and children to study birds, and to protect and care for them in every way. Children may belong to the Junior Audubon Society. When they join they sign the following pledge—

"I wish to become a member of the Junior Branch of the Audubon Society. I will try to protect the wild birds, because I love them for their beauty and appreciate their usefulness.

"I will not kill nor hurt any wild bird. I will not disturb their nests or take their eggs. I will not wear their plumage in any form."

CHAPTER XXVII

TREES

REVIEW—DISCUSSION. Name the trees that you studied last fall. Tell some facts about them. Find in your notebook the pages which tell something about these trees. Watch for the flowers of the red bud and the locusts.



FLOWERS OF THE WHITE ELM.

THE AMERICAN ELM. This spring you will want to get acquainted with more trees. The common American Elm is one of the most beautiful of our forest trees. It is used probably more than any other tree in yards, in parks, and along streets and road-sides. It is sometimes called the white elm.

OBSERVATION. Look at an elm early in the spring before any of its buds open. What is the shape of the tree? Stand at some distance to look at it. How many large branches has it? Notice how far they spread out from the trunk. They look like a huge umbrella. Sometimes they do not spread so far and look more like a slender vase. Notice the great number of small

twigs at the ends of the branches. Get a twig for indoor study. (Notebook, page 71.)

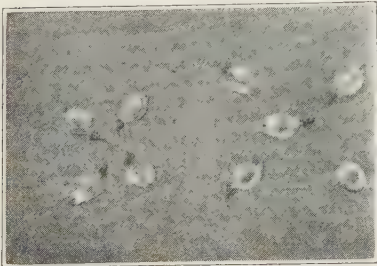
INDOOR OBSERVATION. Examine a twig. What do you find on it? Describe these buds. Notice the shape and color. Are all of the buds the same size? The largest buds make the flowers. The smallest ones are leaf buds. They will open and make twigs and leaves. Draw a twig showing the buds. (Notebook, page 72.)



ELM LEAVES. THE ONE TO THE LEFT IS THE AMERICAN OR WHITE ELM. THE ONE TO THE RIGHT IS THE CAMPERDOWN ELM.

FLOWERS. Keep on the lookout for the openings of buds. The flower buds open first. Examine a cluster of the dainty little flowers. What colors do you find? Keep a twig in water in the school room and watch to see what develops from the flowers. Watch them out of doors on the tree also.

LEAVES. When the leaf buds open, look at the tiny leaves. You may see how they are folded up as they come out of the bud. Watch them now and then until they are full-grown. How can you tell an elm leaf from the leaves of other trees? Notice that it is lopsided at the lower part. Look at the edge or margin of the leaf to see that it is notched like a saw. We say the elm leaf has a saw-toothed margin. The elm is often used as a lawn tree. It also makes a beautiful street tree.



WINGED SEEDS OF THE AMERICAN ELM. THEY ARE ARRANGED IN DESIGNS FOR THE NOTEBOOK.

FRUIT. Before the leaves are fully grown, the fruit that has developed from the flowers is ripe. Notice that it hangs in clusters on the twigs. Examine one of them. What shape is it? Notice the little notch at the top of the circular wing. Where is the seed? (Notebook, page 72.)

The thin membrane around an

elm seed is like a wing that carries the seed far away from the parent tree. For this reason the seed is called a winged seed. Some of the seeds find a resting place along walks and fences where they are not disturbed. Here you will often find young elm trees. They are called seedling trees because they grow from the seeds.

PROJECT. Plant three or four elm seeds in a flower pot. Cover them with a very thin layer of soil. Water them and watch for the appearance of the little trees.



A BEAUTIFUL OLD ELM.

USES. The wood of the American elm is very tough and strong. It is used to make hubs of wheels, to make barrel staves, and the wooden parts of saddles. Sometimes it is used for fence posts. Of late years it is also used to make furniture and for the inner finishings of doors and windows in houses.

FAMOUS ELMS. I wonder whether you have heard of the

Washington Elm. It was in a town called Cambridge, near Boston. It was under this great spreading elm that Washington took command of the army July 3, 1775. It stood growing larger and larger until 1923. Then it fell because it was so old. A tablet marks the spot where it stood.

OTHER ELMS. Besides the white or American elm, you may find other elms in your neighborhood. In the woods, the red elm is rather common all over the United States. You can



LEAF OF A HACKBERRY TREE.

tell it from the white elm by the size and by the roughness of the leaves. The leaves are a little larger, and they feel rough no matter in what direction you rub them with your fingers. The red elm is also called the slippery elm. It gets this name from the inner bark. If you chew a piece of this bark it becomes very soft and slippery in your mouth. Many people like to chew it.

CAMPERDOWN ELM. In parks and on many home grounds, you may find another very pretty elm. It is a low tree with the branches drooping over, almost touching the ground. It is called the camperdown elm.

In some places you may find the English elm and the Scotch elm. These trees have been brought into the United States

from Europe. They are used as shade trees in yards and parks. If you have any of these trees in your neighborhood, collect the leaves. Place them beside leaves of the white elm. Look closely to see how you can tell them from each other. Draw a leaf of each kind. (Notebook, page 72.)

HACKBERRY. The hackberry is a forest tree found in most parts of the United States. It is a near relative of the elm. It is used as an ornamental tree in yards and parks.

OBSERVATION. Notice the warty-looking ridges on the bark. You can always tell the hackberry by its bark. Compare the leaves with those of the elms. How do they differ?

The fruit of the hackberry is not at all like that of the elm. It is a dark purple berry. It ripens in the fall. It has a layer of sweet flesh under the skin. In the middle is one seed. Birds are fond of the fleshy part so they carry the berries away from the tree, eat the flesh and drop the seeds. This is why you find small hackberry trees growing in yards and fields, and along roadsides.

CHAPTER XXVIII

WILD FLOWERS

DISCUSSION. If you live near the woods, go out early in the spring to look for wild flowers. Name some that you find. What are their color? (Notebook, page 74.)

Among the wild flowers of the early spring you will find the spring beauty, the bloodroot, Jack-in-the-pulpit, the dog-tooth violet, the buttercup, the columbine, and violets. Which of them all do you like best? (Notebook, page 74.)

You may wonder why the wild flowers can open up their flowers and leaves so early in the spring. This is because they get ready the fall before. You can understand how they get ready by studying the plant of a violet.

VIOLETS. Look at a patch of violets and notice that there are many plants standing close together. Observe the leaves. What shape are they? Draw or color one. (Notebook, page 75.) Observe the flowers. What colors do you find? Where are the flowers fastened to the plant. Draw or color one. (Notebook, page 75.)

Carefully dig up a violet plant. Notice that it has a stem about as thick as your pencil that branches and spreads out under the ground. This kind of underground stem is called a rootstock. On the ends of some of the branches look for buds. On the lower part of the rootstock find the slender roots. The branches of the rootstock grow and spread out under the ground. Then each forms a bud which sends up a new plant. That is why there are so many violet plants growing close together. (When through studying the plant, set it in the ground again.)



DOG-TOOTH VIOLETS, ONE OF THE
EARLY SPRING FLOWERS.

In the latter part of the summer, violet plants store up food in their rootstocks. They also make buds. Then the leaves die and the plants go to sleep for the winter. When the warm days come in the spring, the buds begin to open. They use the food that is stored for them in the rootstock. In a few weeks, they have leaves and their pretty blue flowers.

Violets have another way by which they spread rapidly. Late in the summer, if you look under the violet leaves, close to



A VIOLET SHOWING THE ROOTSTOCK WHICH SPREADS UNDERGROUND AND SENDS UP NEW PLANTS.

the ground, you will find some queer, greenish white flowers. They are very small and they do not open as the blue flowers do. Since they are hidden away, no one can pick them. They produce seeds that are scattered to make new plants.

Most wild flowers have some kind of underground stems. The spring beauty and Jack-in-the-pulpit have tubers similar to the potato tuber. The dog-tooth violet has a bulb like a tulip. Some have rootstocks. All of them store up food in the fall and make buds for the new plants in the spring. You see then, why they can open their flowers almost as soon as winter days are over.

SAVING THE WILD FLOWERS. I wonder whether you know that there are not as many wild flowers now as there were a

number of years ago? One reason for this is that trees are cut down and the ground is plowed up and planted in farm crops, so the wild flowers are all destroyed. This, of course, is all right where people need to raise other crops than trees. Another reason is that many people who go to the woods dig up the wild flowers and carry them off to their homes to set them out hoping they will grow. In most cases, they do not grow.



WILD COLUMBINE.

Still another reason is that people go to the woods and gather great numbers of bouquets of wild flowers. These wither usually before the people reach their homes and are thrown away. You know that flowers are necessary in order that the plants may have seeds. If all the flowers are picked, then the plants cannot make seeds for new plants. Little by little in this way the wild flowers disappear from the woods.

What should you do about it? In the first place learn to enjoy the flowers where they are growing and leave them for

other people to enjoy. Do not pick any flowers unless they are very abundant. Usually it is all right to pick violets, because, as you know, they succeed in making new plants anyway. In the second place, do not dig up any of the wild plants unless the woods are being cleared. When this is the case it is a good thing to dig up as many flowering plants as possible. Set them out and try to get a wild flower garden on your home and school grounds. (Notebook, page 75.)

STORY—Saving the Wild Flowers

It was Saturday morning. Tom came rushing up the stairs two steps at a time. He burst into his mother's room shouting, "Dad has the day off. He says get a lunch ready. We'll all drive over to Bank's Grove for a picnic."

Mother looked up from her dusting, "Fine, Tom," she said, "Fine. I have been longing for a day in the woods all spring. Find Barbara, then both of you come to the kitchen and we shall have a lunch ready in no time. But," she added, "first skip across the street and invite Mary and Jimmie Maxey to go with us."

In less than half an hour, Mother, Dad, the four children, and the baskets of lunch were all in the car ready to start.

It was a sunny morning in May, the air was soft and warm. Everything out of doors seemed to say—"Spring has come to stay." It was joy simply to ride along and look at the fields, some with little green tufts of wheat and oats sprinkled all over them; some with the dark soil newly turned up by the plow; and others covered with a thick carpet of grass where cows, calves, and colts were feeding.

Now and then a meadow lark flew up to a fence post, sat with its bright yellow breast toward them and sang its tuneful, bell-like melody. A smaller bird, that Tom said must be a little meadow lark, because it looked like one, perched on the top of a telephone pole and called "Dick! Dick! Cissel! Cissel!" Among the shrubs in a nursery two song sparrows sang lustily.

"Listen," said Jimmie, "One sings, then the other answers him."

A beautiful red winged blackbird teetered on the top of a tall cattail, and sang "Too-go-loo, Too-go-loo" in a very pleasing manner. In fact one delightful thing after another greeted them as they rode along.

Presently, Dad called in a distressed tone. "Look there! Will you?"

Mother answered, "O, how dreadful!"

The children, who were trying to decide whether the right name for the long brown bird that had just skipped over the hedge was brown thrush or brown thrasher, stopped their discussion to see what was the matter.

At the same time Dad stopped the car, while he and mother stared at some men who were cutting down a tree on the other side of the fence.

"What is the matter?" cried the children together.

"Look," said Dad, "They are clearing Bank's Grove. It is nearly gone. All those old oaks, hickories, maples, ash, and the rest. It was the finest bit of woods for miles around."

"And it had more beautiful wild flowers than any other," chimed in mother. "I have come here for wild flowers ever since I was a little girl. Now they will all be destroyed. It is dreadful."

"Dreadful! I should say," answered Dad. "It should not be allowed. But then, who can stop it? John Banks owns the land and the trees. I guess he has a right to clear it if he wants to."

"I thought the woods belonged to everybody," cried Tom.

"Well, you see they do not," answered Dad.

"Why don't they? Why don't a lot of people go together and buy up nice woodlands like this and keep them for themselves and everybody, and never, never clear them nor sell them?"

"Because, they have never thought about it, I guess," said Dad, "But it is a good idea, son, a good idea. However, it is too late for this plot. It is gone for good."

"And all the flowers with it," moaned mother.

"Can't we have our picnic?" cried Barbara as she realized that this was the woodland for which they had started.

Mother and Dad smiled a little at that.

"Not here, at any rate," said Dad. "We shall drive on to Miller's Crossing. I guess the woods there are all right."



A DELIGHTFUL SPOT IN THE WOODS.

So on they went for another hour. They opened a gate and drove into a woods. They crossed a rustic bridge under which a small stream gurgled. Then around they drove among tall trees that almost touched each other overhead.

On an open spot, covered with thick grass near the river, they stopped. The children were out of the car in an instant running about among the trees just for fun. Some of the

trees, the maples, elms, ash, and buckeyes were almost covered with new green leaves. But the oaks, walnuts, and hickories were just beginning to open up their pink and yellow-tinted buds.

"They are almost as beautiful as flowers," Mary declared, as Tom bent down a large branch of a white oak so they could get a closer look at it. "Feel how soft and fuzzy these tiny leaves are."

"O, come here! Come here, quick!" shouted Barbara from the foot of the hill.

They all hurried to the spot and there stood Barbara in a delightful garden of wild flowers.

"Oh! Oh!" they all shouted at once. Then there was a perfect chorus as they ran first in one direction, then in another. "See the bluebells." "Here is a whole bank of violets." "See these umbrellas with white flowers underneath." "Look at that tall pink one. What is it?"

"I wish I knew all their names," said Mary.

"We can get armfuls to take home," said Tom. With that, they all began picking flowers as fast as they could. Mary had her hands full of bluebells when she came to a great patch of violets. She laid the bluebells down and began picking violets.

"Come here, Barbara," she called, as she bent over, looking at a little cluster of flowers close to a shrub. "Aren't these the loveliest things you ever saw? They are like pansies, dark velvety purple and light blue. Let's get every one of them."

"Why do you want them all?" a low voice asked, close at her elbow. She straightened up and there stood a young man smiling at her and Barbara.

He was dressed in a khaki suit and carried a notebook and pencil in his hand. He looked so happy and kind that the children were not the least bit afraid of him.

"Why do you want them all?" he repeated.

"Because they are so beautiful," Mary answered.

"How long do you think they will stay beautiful if you pick them? Look at that bunch of bluebells that you laid down by the log."

Mary went over and picked up the bluebells. "Why, they are wilting already."

"They always do, you know," answered the man. "By the time you reach home, most of the flowers you have gathered will be so badly wilted that you will throw them away, just as everyone does. Don't you want me to tell you a better way to show your love for the wild flowers?"

While he was talking, Tom and Jimmie came running toward them, but they stopped to listen when they heard the man talking.

"This pansy-like violet, that you have found is the rarest and the most beautiful of all our violets. It is called the birds-foot violet. Do you see why? It is because the leaves are divided like the toes of a bird."

"So they are," said Mary. Then all the children came near to have a closer look at them.

"There used to be a number of these scattered all through these woods," said the man. "Now, there are very, very few."

"What has become of them?" asked Barbara.

"Because they are so pretty, people dug them up and took them away to plant on their home grounds, where probably most of them died. People who do not dig them up gather all the flowers, just as you wanted to do. So there are none left to make seeds and start new plants. Before long there will not be a single plant left. They are so beautiful here in the woods. Doesn't it seem too bad to utterly destroy them? Wouldn't it be better to leave them for everyone to enjoy?"

Mary looked very sober. "I should think so," she said. "I shall never pick another one of them, and never dig one up."

"That is the way we want boys and girls to feel about the wild flowers. Don't pick any except those that are in no danger of being exterminated and don't dig up any except where the woods are being cleared. The common blue violets spread so rapidly by means of their underground stems that there is little danger of killing them out by picking the flowers.

Mary looked up eagerly into the man's face. "Do you know the names of all the flowers here?" she asked.

The young man did not answer. Instead, he stepped quickly over to Tom and took from the great bunch of flowers the boy carried, a large white, three-cornered one.

"Where did you get this?" he cried. "I thought the last one was gone. I am so glad you have found another. But, Oh! I wish you had not picked it."

"What is it?" asked Tom.

"The giant white trillium. Can you show me where you found it?"

"Yes, it was just beyond the next little hill. Come on." So Tom led the way to a shady spot not far from the river bank. They all searched until they found the broken stem. The man picked up a stick, sharpened it with his pocket knife and pounded it into the ground close to the plant. "There," he said. "I shall know where to look for it next year. Perhaps in time, I can get some seeds to start more plants. If people will only leave it alone."

"I wish I could find you another," said Tom. "You may be sure I wouldn't pick it."

"You do know the names of all the flowers, don't you?" Mary asked again.

The man smiled. "I ought to," he said. "I have played among them, studied them, and tried to protect them ever since—well, ever since I was about the size of this lad," and he laid a hand upon Jimmie's shoulder.

"Won't you tell us? I only know bluebells, violets, and Jack-in-the-pulpits."

"Oh, do tell us," chimed in the others.

"Well, I am ready. Which one do you want to know first?"

"This," said Tom, as he held a bunch of brownish purple flowers before the man. "It is three-cornered like the white one."

"This is a trillium, too, the little purple trillium. It is the same shape as the white one. I am glad you noticed that."

"What are these dainty pink ones?" asked Mary.

"The little wood anemones. They are also called wind flowers."

"Their leaves are almost like ferns," said Barbara. "I hadn't noticed leaves much before. They are about as interesting as flowers. No two are alike. Wouldn't it be fun to see how many different kinds of leaves we can find among the wild flowers? It wouldn't hurt to pick the leaves, would it?"

"It would if too many people did it," Tom piped up before the man had time to answer. "For the plants would be broken to pieces."

"And then," said the man, "the leaves make the food for the entire plant, you know. It wouldn't do for a plant to lose too many leaves." With this he stepped to one side and touched a broad leaf saying, "Here is one of the very prettiest of all the leaves. It is so notched and scalloped that it looks as if some one had cut it out with a pair of scissors. The plant is called blood root."

From here, they moved along from one interesting plant to another. They saw the pretty spreading buttercups, the fringy Solomon's seal, the funny Dutchman's breeches, the little purple cup of the wild ginger hidden between the bean-shaped leaves, the tall pink geraniums, the dainty blue-eyed Marys, and the white wax-like flowers of the May apple.

In a shady ravine between two sloping hills, they found three exquisite maiden hair ferns.

"When I was a boy," said the man, "This entire ravine and both of these hillsides were completely covered with these beautiful ferns. Now as you see, they are almost gone. They, too, have been dug up and carried away."

"Can't it be stopped?" asked Mary.

"I hope so in time," answered the man. "I am doing all I can to stop it here and in other woods. I belong to a society for the preservation of wild flowers. A great many men and women all over the country belong to this organization and everywhere they are trying to interest others, both young and old, in saving the wild flowers. When enough people are truly interested, the destruction will stop."

Just then mother came through the woods toward them.

"Children, children," she called. "Where are you? Lunch is ready, waiting."

Barbara and Tom rushed to her side. Mary and Jimmie followed.

"O mother!" Barbara cried, "We have had such a good time. I know the names of nearly all the flowers."

This is the purple trillium," shouted Tom.

"And this is—" all the children talked at once so there was a perfect jumble of flower names.

The young man looked at mother and then they both laughed. "I have been giving them a little lesson on wild flowers," he said. "They are apt pupils."

Won't you come and eat lunch with us," asked mother, "and tell us more about them?"

"No, thank you, I just heard our dinner bell across the fields. My mother will be waiting for me. Goodbye, children."

"Goodbye. Thank you so much," said Mary.

Then all the children gathered around him and said, "Thank you, many, many times."

"Come again, and have another lesson," he said as he hurried off through the woods.

"We are not going to pick wild flowers any more," Barbara confided to her mother, as they walked along. "I shall tell you why."

But just then they came in sight of the delicious lunch spread on a white cloth on the green grass, and for a time flowers were forgotten.

On the way home the subject was revived. "You see he was right," said Barbara. "Most of the flowers we picked were so wilted we didn't even put them into the car. It is better to leave them where they are for everyone to enjoy."

After a few minutes, Tom, who was usually the one to think of new things, said, "Let's form a society of our own to help save the wild flowers."

"Oh let's," said all the others.

"What shall we call it?"

They all sat still thinking. Then Jimmie, who was usually the slowest to speak up said, "I think The Wild Flower Saving Society would be a good name," and they all agreed.

"We shall ask the other kids to join," said Tom, "but we must have a pledge that everyone will promise on his sacred honor to keep forever. What shall it be?" After a long silence he continued, "How will this do? First, We promise to protect wild flowers wherever we find them. Second, We shall not pick any wild flowers."

"Except common blue violets when they are very abundant," added Barbara.

"Third, We shall never dig up wild flowers except where woods are being cleared," said Jimmie.

"Let's say, too," said Mary, "that when we find plenty of seeds, we shall scatter some of them in places where the plants have been dug up."

"And then suppose after we have done all this," cried Barbara, "some one takes a notion to clear the woods what will become of our flowers?"

"All killed off," said Tom. "The woods will have to be saved too. There is no other way. I do not mean all of the woods, of course, but patches here and there of the nicest, prettiest ones."

"The ones where there are plenty of wild flowers," added Barbara.

"Let's get Dad and Mother to begin working that up with their friends. The grown-up folks ought to do something. We shall tell them that some of the woodlands must be saved for—for—all time to come—for everybody to enjoy. And for children to study and find out things," said Mary. "I am so glad I am going to help save the wild flowers."

"And the woods too," said Tom. "I think everybody will want to help. Don't you?"

CHAPTER XXIX

CLEANLINESS—HEALTH

DISCUSSION. Name all the different things that are included in the term cleanliness. Look through the ten health rules on page 77. Which of them have something to say about cleanliness? Write in your notebook the different things you have done this year to observe cleanliness. (Notebook, page 77.)

Cleanliness means many things. It means clean bodies, clean hands and nails, clean hair, and clean clothing. Cleanliness also means clean homes and clean schoolrooms. It means clean milk. It means clean yards and clean streets. It means pure water to drink, and pure air to breathe.

CLEAN BODIES. Clean bodies means that you should bathe frequently. Why should you do this? In the first place, dust settles upon the body and it must be washed off. Then dry dead scales of the skin remain on the body and should be washed off. If a bath is not taken often the body and clothing acquire an unpleasant odor. Another reason for bathing is that it improves the appearance. Clean fresh-looking faces and clean smooth hands are always attractive.

The best time to bathe is either in the evening before going to bed or in the morning when you arise. Some people like to take a cold bath in the morning. This makes them feel full of energy for most of the day. A warm bath should be taken in the evening rather than in the morning. Soap should be used with the warm bath to cleanse the body.

Every person should have his own towel. Especially is this true in schools and other public places. Some schools provide paper towels so that no one wipes twice on the same towel. In some schools each child provides a towel for himself. You see the reason for having individual towels. Certain germ diseases of the skin and also of the eyes may be transmitted by germs from one person to another if many people use the same towel.

CLEAN HOMES. Fourth grade children can help to keep the home and also the schoolroom clean. You can help dust the furniture. An oiled cloth should be used for this. Do you see why? It catches and holds the bits of dust so they cannot fly around in the air of the room. When sweeping or dusting, windows and doors should be wide open to allow dust particles to be carried out of doors.

CLEAN YARDS. What do you do to help keep your yards clean? Who raked dead leaves and stalks from the yard this spring? Who are careful about throwing bits of paper, orange peelings and the like in the yard or along the streets?

The yards should be kept clean. Piles of rubbish or tin cans should not be left in the yards or gardens. You will enjoy your garden much more when you help to keep the entire yard neat and clean.

CHAPTER XXX

RECALLING THE YEAR'S WORK—VACATION

HEALTH. Name all the health habits you have been trying to keep this year. Which ones were hard to keep? Which ones were easy? Try to recall some of the health studies you have made this year.

WEIGHING AND MEASURING. How often have you been weighed this year? How often have you had your height measured? How much more do you weigh now than you did in the fall? What have you gained in height? (Notebook, page 77.)

FOODS. I am thinking of good foods for children to eat. Name some. What is meant by a balanced diet? (Notebook, page 14.)

EXERCISE. I am thinking of some good games for fourth grade children to play. Name some. Why should you play or work out of doors everyday?

DRINKS. Think of good drinks for children. Why should you drink plenty of water?

TEETH. What are your first teeth called. What are the teeth you have now called? Give some reasons why you should brush your teeth.



FOURTH-GRADE CHILDREN PLAYING A BALL GAME.

CLEANLINESS. I am thinking of some good reasons why children should bathe often. What are they? (Notebook, page 77.)

NATURE STUDY. Think back over the year and try to recall the different objects in nature that you have studied.



A YOUNG GARDENER HAVING A GOOD TIME
WITH HIS PLANTS.

GARDEN PLANTS. Name three vegetables and three flowering plants that you have studied.

I am thinking of some climbing plants. Name two.

HOME MAKING INSECTS. Name three home-making insects. What do you remember about their homes?

TREES. Think of all the trees you have studied this year. Name one. Tell an interesting fact about it. (Notebook, page 79.)

WILD MAMMALS. I am thinking of some wild mammals that live in the ground most of the time. Name two. Name some other wild mammals. Tell something about each.

BIRDS. Think of all the birds you have learned something about this year. Which ones do you like best? Why?

WILD FLOWERS. Tell what may be done to save some of our wild flowers.

VACATION. Now that the school year is almost ended, you may begin to plan for your vacation. What are some things that you would like to do during the summer? What health rules may be easily practiced during the summer? What work may you do that is healthful? Think of your gardens. Nothing is better for you than to work a short time during the cool of the morning or evening in your garden. You will, of course want to play also. Some work and some play will fill your vacation with pleasure. Perhaps you may take a trip with your parents or friends. In any case you will spend most of your vacation out of doors. Do not forget to keep your eyes open for the birds and trees and flowers.

BIBLIOGRAPHY

NATURE BOOKS FOR CHILDREN

The books that are starred are of special value for fourth grade supplementary reading. Any book in this list may be ordered from McKnight & McKnight, Normal, Ill.

BIRDS

*BLANCHAN, "Birds Every Child Should Know," Grosset & Dunlap, New York	\$0.75
*BURGESS, "Bird Book for Children," Little, Brown & Co.	3.00
*PATTERSON, "How to Have Bird Neighbors," D. C. Heath & Co.	.92
DUGMORE, "Bird Homes," Doubleday, Page & Co.	5.00

INSECTS

*MORLEY, "Bee People," A. C. McClurg & Co.	\$1.25
*COMSTOCK, "Ways of the Six Footed," Ginn & Co.	1.00
MORLEY, "Grasshopper Land," A. C. McClurg & Co.	1.25
*TURNER, "Common Friends & Foes," American Book Company.	.50
PATTERSON, "Harmful & Helpful Insects," F. A. Owen Publishing Co., Dansville, New York.	.30
SCHWARTZ, "Grasshopper Green's Garden," Little, Brown & Co., Boston, Mass.	.60
FABRE, "Insect Adventures," American Nature Association, Washington, D. C. ..	2.00

TREES

*PACK, "School Book of Forestry," American Nature Association, Washington, D. C.	\$1.00
PACK, "Our Vanishing Forests," American Nature Association, Washington, D. C.	2.00
*ROGERS, "Trees Every Child Should Know," Grosset & Dunlap.	1.00
*PATTERSON, "Flowers, Birds & Trees," F. A. Owen Publishing Company, Dansville, New York.	.15

ANIMALS

*BURROUGHS, "Squirrels and Other Fur Bearers," Houghton Mifflin Co. \$0.92 and \$1.75	
*PIERSON, "Among the Night People," E. P. Dutton and Co.	1.60
*PIERSON, "Tales of a Poultry Farm," E. P. Dutton and Co.	1.60
*SETON, "Animal Heroes," Charles Scribner's Sons.	2.50

MISCELLANEOUS

*STACK, "Wild Flowers Every Child Should Know," Grosset & Dunlap.	\$1.00
*BURGESS, "Flower Book for Children," Little, Brown & Co.	3.00
*Star Stories for Little Folks," The Pilgrim Press, Chicago, Illinois.	.60
PATTERSON, "The Spinner Family" (Spiders), A. C. McClurg & Co.	1.20

HEALTH EDUCATION BOOKS FOR PUPILS

*BOOTH & CARTER, "Mary Gay Stories," World Book Co.	
*FERGUSON, "A Child's Book of the Teeth," World Book Company.	.44
*ANDRESS, "A Story of Rosy Cheeks and Strong Heart," MacMillan Company.	.30
*GRIFFITH, "Cho-Cho and the Health Fairy," MacMillan Company.	.15
*PETERSON, "Rhymes of Cho-Cho's Grandma," MacMillan Company.	.20
"The King and His Wonderful Castle," Public School Publishing Co., Bloomington, Illinois.	.50
*HAVILAND, "The Most Wonderful Horse in the World," J. B. Lippincott Company, Trade Ed. School.	.80

- Pamphlets of Metropolitan Insurance Co., Madison Avenue, New York..... Free
 WEANT, "Health and Grace Giving Exercises, Games and Drills"..... .30
 "See Healthland First," American Child Health Association, 370 7th Avenue,
 New York City.
 PAYNE, "We and Our Health," American Viewpoint Society.

NATURE BOOKS AND OTHER HELPS FOR TEACHERS

METHODS AND GENERAL HELPS

- BAILEY, "The Nature Study Idea," MacMillan Co..... \$1.90
 PATTERSON, "Studies in Science," Row Peterson & Company..... 1.20
 COULTER & PATTERSON, "Practical Nature Study," D. Appleton & Company... 1.60
 COMSTOCK, "Handbook of Nature Study," Comstock Publishing Co..... 5.00
 CHAPMAN, "Handbook of Birds of Eastern North America," D. Appleton &
 Company 4.00
 REED, "Land Birds East of the Rockies," Doubleday Page & Company..... 1.00
 CHAPMAN, "Our Winter Birds," D. Appleton Co..... 1.50
 WEED & DEARBORN, "Birds in Their Relations to Man," Lippincott & Company. 2.50
 CHAPMAN, "Travels of Birds," D. Appleton & Co..... .76
 Farmers' Bulletin No. 513. Colored plates of 50 birds. Supt. of Documents.. .15
 HENSHAW, "The Book of Birds," National Geographic Society..... 3.00

GARDENS AND WILD FLOWERS

- KEELER, "Our Garden Flowers," Scribner..... \$3.00
 STOUT, "Gardening," World Book Company..... 1.60
 IVINS, "Garden Crops," Rand McNally Co..... 1.00
 FLETCHER, "Soils," Doubleday Page & Co..... 2.00
 GEORGIA, "A Manual of Weeds," MacMillan Co..... 3.00
 WEED, "Wild Flower Families," Lippincott Company..... 1.25

INSECTS

- COMSTOCK, "Manual for the Study of Insects," Comstock Pub. Co..... \$4.25
 LUTZ, "Fieldbook of Insects," G. P. Putnam's Sons..... 3.50
 COMSTOCK, "The Spider Book," Comstock Pub. Co.

TREES

- KEELER, "Our Native Trees," Charles Scribner's Sons..... \$3.00
 ROGERS, "The Tree Book," Doubleday Page & Co..... 5.00
 MOSELEY, "Trees, Stars & Birds," World Book Co..... 1.80
 EMERSON AND WEED, "Our Trees, How to Know Them," Lippincott..... 3.50

ANIMALS

- *HORNADAY, "The American Natural History," Charles Scribner's Sons..... \$5.00

HELPFUL PERIODICALS

- Nature Magazine, American Nature Association, Washington, D. C..... \$3.00
 Bird Lore, D. Appleton & Co., New York, N. Y..... 1.50
 Garden Magazine, Doubleday Page & Co..... 3.00
 "American Forests and Forest Life," American Forestry Association, Wash-
 ington, D. C..... 4.00

ENCYCLOPEDIAS

- Compton's Pictorial Encyclopedia, 10 vol., F. E. Compton Co
 "The Book of Rural Life," 10 vol., The Bellows Durham Co.
 SOURCES OF PICTURES FOR NOTEBOOKS, BOOKLETS, POSTERS, ETC.

BIRD PICTURES—

- McKnight and McKnight, Normal, Ill.
 G. P. Brown Co., Beverly, Mass.
 Joseph H. Dodson, Kankakee, Ill.

PICTURES OF WILD MAMMALS, FISH, WILD FLOWERS—
Comstock Pub. Co., Ithaca, New York.
G. P. Brown Co., Beverly, Mass.

PICTURES OF GARDEN FLOWERS AND VEGETABLES
Children's Flower Mission, Cleveland, Ohio.

CONSTRUCTION PAPER IN COLORS—
McKnight & McKnight, Normal, Ill.

HEALTH EDUCATION HELPS

GENERAL

Class Room Weight Record. Department of Interior, Bureau of Education,
Washington, D. C.
Weight-Height-Age Tables for Boys and Girls. Department of the Interior,
Bureau of Education, Washington, D. C.

BOOKS

DANSBILL, "Health Training in School," National Tuberculosis Association, 360 7th Avenue, New York.....	\$1.25
COBB, "Graded Lessons in Hygiene," World Book Company. Bk. I—\$1.36. Bk. II—\$2.00.....	3.36
WINSLOW, "Healthy Living," Charles E. Merrill Company. Bk. I—80c. Bk. II—\$1.00.....	1.80
THOMAS D. WOOD, "Health Education," Thomas D. Wood, M.D., 525 West 120th Street, New York City.....	.50
Health, Plays, Games and Assemblies, State Board of Health of Kentucky.....	.50
CLARK, "Physical Training for Elementary School," Sanborn.....	2.00
"Who's Who in Healthland".....	.10
From Dr. Thomas D. Wood, 525 W. 120th St., New York.	
"Health Essentials of Rural School Children".....	.15
"Health Improvement in Rural Schools".....	.25
"The Teacher's Part in Social Hygiene".....	.15
HAVILAND, "Good Neighbors," Lippincott Company.	
First Aid Instruction in School. American Red Cross, Washington, D. C.	

PAMPHLETS

The following may be secured for five cents each from The American Child Health
Association, 370 7th Avenue, New York City.

Diet for the School Child.
Milk.
Sleep.
The Lunch Hour at School.
Teaching Health.
The Kindergarten and Health.
Growing Healthy Children.
Your Opportunity.
Child Health Program for Parent-Teacher Associations.
The Continuing Need for Teachers of Child Health.
Dramatics of Health Teaching.



P9-EAH-087

